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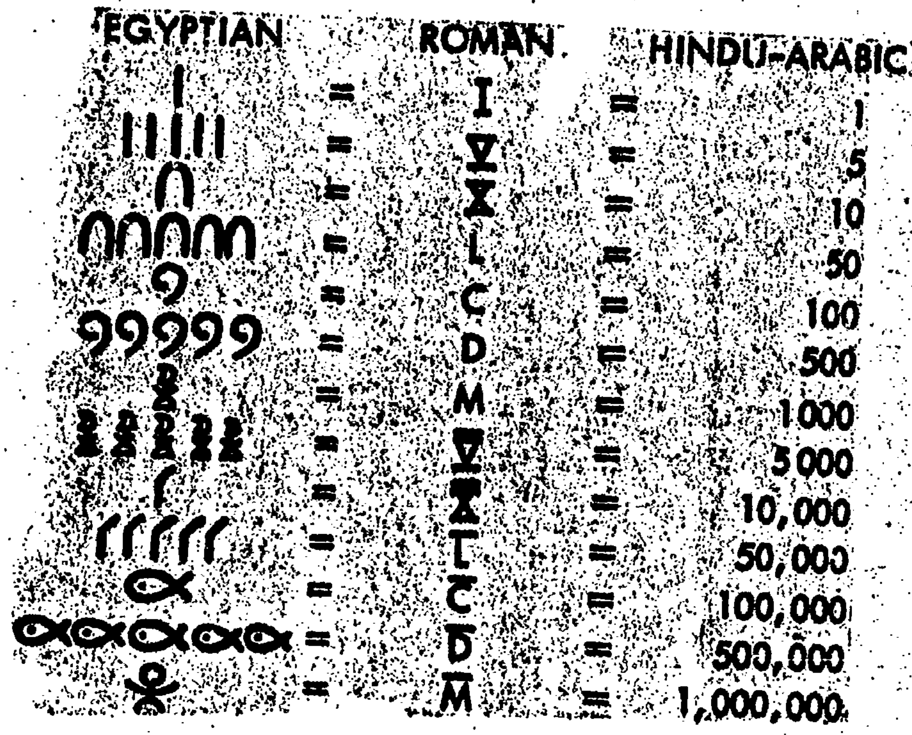
ABSTRACT

This series of 12 teacher-prepared Learning Activity Packages (LAPs) for General Mathematics 2 covers the topics of numbers; descriptive statistics; calculations with whole numbers and percents; measurement; geometric concepts; formulas, areas, and volumes; introductory algebra; integers; indirect measurement; insurance, taxes, and savings; consumer mathematics; and different number bases. Each unit contains a rationale for the material being covered; lists of behavioral objectives; a list of reading assignments, problem sets to be completed, and tape recordings; and a student self-evaluation problem set. (DT)

LEARNING ACTIVITY PACKAGE



THE WORLD OF NUMBERS

Ninety Six High School
Ninety Six, S.C.

GENERAL MATH 102

LAP NUMBER 13

REVIEWED BY

WRITTEN BY James E. Byers
and McMullan

101172 3

I N S T R U C T I O N S

I. Read Rationale

II. Read BEHAVIORAL OBJECTIVES.

III. Resources

A. All work must be done in math notebook with pencil only.

B. Keep your notebook up to date. Your teacher may ask for it at any time (without warning).

C. Work all the Exercises in at least one text for each objective. Always check your exercises in your notebook. (see your teacher.)

IV. Self-Evaluation

A. Must be taken at completion of activities for each section.

B. Does not affect your grade in any way.

V. Advanced Study

A. To be done only after all previous work has been satisfactorily completed.

B. Must be approved by teacher.

VI. Progress Test and LAP Test

A. Teacher graded

B. Recycling may take place at this time if test is not satisfactory.

DO NOT LOSE YOUR LAP. If you do, you must buy another one.

RATIONALE

What time is it? How much does it cost? What's his batting average?

All of these questions can be answered with numbers.

In this LAP you will explore different number systems, the meaning of "place value" and how to express the idea of a number as a symbol (10_5) as well as a picture graph.

Section I: The World of Numbers

Behavioral Objectives:

After the completion of your prescribed course of study, you will be able to:

1. Given any whole number name the place value of each digit.
2. Given any number, round them to the nearest unit-- tens, hundreds, thousands; also, tenths, hundredths, or thousandths.
3. Given a base 5 numeral, name the place value and numerical value of each digit.
4. Given a base 5 numeral, write it as a base 10 numeral and vice-versa.
5. Given a list of fractions:
   a. Write the equivalent decimal numeral.
   b. Write the equivalent per cent.
6. Given a list of per cents:
   a. Write the equivalent decimal numeral.
   b. Write the equivalent fraction in lowest terms. (Improper fractions are to be written as mixed numbers.)
7. Given any decimal, write the equivalent per cent.
8. Given any numeral up to 7 digits, write it in words and vice-versa.
9. Define the following:
   a) digit
   b) integer
   c) numeral
   d) numerical value
   e) per cent
   f) numerator
   g) denominator

Resources:

OBJECTIVE 1:

General Math II: read pp. 13-17, Ex. 17-22, p. 18; Ex. 1 and 2 p. 62

Wollensak Teaching Tape

C3301 Understanding Decimals

C3432 The Decimal System

OBJECTIVE 2:

General Math II: read pp. 26-28, Ex. 1-16, p. 29; Ex. 39-44 p. 34; Ex. 5 and 6 p. 62; Ex. 3 and 4 p. 66.

General Math I: read pp. 182-184 Ex. 1-5, 11-15, p. 184.

Mathematics 8: read pp. 10-12, Ex. 1-6, p. 11

Wollensak Teaching Tape (Get worksheet from teacher)

C3051 Rounding Off: Whole Numbers

C3054 Rounding Off: Decimals

C3052 Rounding Off: Fractions to Whole Numbers

C3053 Rounding Off: Fractions to Fractions

OBJECTIVE 3:

General Math II: read pp. 18-21, Ex. 7-24, p. 22

Mathematics 8: read p. 137, Ex. 1-3, p. 137

OBJECTIVE 4:

General Math II: read pp. 18-21, Ex. 25-32, p. 22; Ex. 7 and 8 p. 63

General Math I: read pp. 89-92, Ex. 1-15, p. 92

Wollensak Teaching Tape

C3437 Converting to Base 10

C3438 Converting from Base 10

OBJECTIVE 5:

General Math I: Read pp. 30-34, Ex. 27-38, p. 34; read pp. 35-38, Ex. 25-28, p. 38; Ex. 13-14, p. 63; Ex. 5-8, p. 66

General Math I: read pp. 180-181, Ex. 1-20, pp. 181-182, read pp. 224-226, Ex. 1-20, pp. 226

Wollensak Teaching Tape

C3151 Introduction to Per Cent

C3152 Changing Fractions to Per Cent

OBJECTIVE 6:

General Math II: read pp. 35-38, Ex. 5-12, p. 38; Ex. 15-16, p. 62; Ex. 9-10, p. 66

General Math I: read pp. 221-222, Ex. 1-20, p. 222

Wollensak Teaching Tape

C3155 Changing Per Cent to Fractions

C3154 Changing Per cent to Decimals

OBJECTIVE 7:

General Math II: read pp. 35-38, Ex. 13-20, p. 38

General Math I: read pp. 222-224, Ex. 1-15, p. 224

Wollensak Teaching Tape

C3157 Changing Decimals to Per Cent

OBJECTIVE 8:

General Math II: read pp. 23-24, Ex. 1-20, 25-34, p. 25

OBJECTIVE 9:

General Math II: read p. 67 Ex. 1-7, p. 67

Self-Evaluation Section I

1. Write the place value of the digit "4" in each of the following numbers.

   a) 7,364 _____

   b) 4,250 _____

   c) 634,004 _____, _____

   d) 18,034,621 _____

2. Round off the following numbers to the nearest hundred.

   a) 702 _____

   b) 695 _____

   c) 12,431 _____

   d) 183,614 _____

3. Round off the following numbers to the nearest thousand.

   a) 6,893 _____

   b) 4,010 _____

   c) 12,499 _____

   d) 134,601 _____

4. Round off the following to nearest tenth.

   a) 1.61 _____ b) .09_____ c).129_____ d) .46_____

5. Rewrite the following in base 10.

   a) 21_5 _____ b) 32_5 _____ c) 13_5 _____

6. Rewrite the following base 10 numerals as base 5 numerals.

   a) 15 _____ b) 16 _____ c) 22_____

7. Change the following to equivalent decimal numerals:

   a) $\frac{4}{10}$ ____ b) $\frac{27}{100}$ _____ c) $\frac{53}{1000}$ ____

   d) $\frac{7}{10}$ ____ e) $\frac{3}{100}$ _____ f) $\frac{12}{10}$ _____

Self-Evaluation (cont')

8. Express the following as per cent:

a) $\frac{6}{100}$ _____ b) $\frac{27}{100}$ _____ c) $\frac{53}{1000}$ _____

d) $\frac{33\frac{1}{3}}{100}$ _____ e) $\frac{3}{4}$ _____ f) $\frac{2}{25}$ _____

g) $\frac{30}{100}$ _____ h) $\frac{3}{10}$ _____ i) $\frac{.3}{10}$ _____

j) $\frac{\frac{1}{3}}{100}$ _____ k) $\frac{.3}{100}$ _____ l) $\frac{215}{100}$ _____

9. Express the following as equivalent decimal numerals:

a) 5% _____ b) 30% _____ c) 100% _____ d) 120% _____

e) 25% _____ f) 125% _____ g) .5% _____ h) 1½% _____

10. Write the following numbers in words:

a) 42 _____.

b) 40,040 _____

c) 140 _____

d) 44,404 _____

e) 10,000 _____

11. What is the place value of the digit "2" in each of the following numerals?

a) 2_5 _____ b) 200_5 _____

c) 24_5 _____ d) 2030_5 _____

12. Express the following as per cent:

a) .112 b) 1.00 c) .03

d) .8 e) 1.35 f) .455

g) .755 h) .003 i) .90

Behavioral Objectives:

At the completion of your prescribed course of study, you will be able to:

10. Construct a bar and/or broken line graph and compare specific items on each graph as well as state the trend that each graph shows.

11. Interpret a given picture graph.

12. Answer specific questions relating to a given circle and/or rectangle graph.

13. Define the following:

    a) table

    b) graph

    c) axis

Section II

Resources

OBJECTIVE 10:

General Math II: read pp. 39-44, Ex. 1,2, and 8, pp. 44,45 and 46; read pp. 49-51, Ex. 1,2 and 8, p. 52

General Math I: read pp. 259-261, Ex. 1-8, p. 262; read pp. 263-266, Ex. 1, p. 266; read pp. 269-271, Ex. 1-8, p. 272; read pp. 273-275, Ex. 1-2, p. 276

OBJECTIVE 11:

General Math II: read pp. 53-54, Ex. 102, p. 55

General Math I: read pp. 287-289, Ex. 1-8, p. 290

OBJECTIVE 12:

General Math II: read pp. 56-58, Ex. 1-2, p. 58 and 59

General Math I: read pp. 277-279, Ex. 1-8 p. 279 read pp. 282-285, Ex. 1, p. 285

OBJECTIVE 13:

General Math II: read pp. 67, Ex. 8-10, p. 67

Make a bar graph to picture the data in the following tables:

1.

HOME RUNS HIT BY HIGH SCHOOL LEAGUE TEAMS IN CURRENT YEAR

Central	9
Lincoln	18
Roosevelt	14
Yeer	23

2.

SEMI-PROFESSIONAL MALE WORKERS, 1971

Draftsmen	113,298
Photographers	43,401
Radio Operators	14,259
Sports Instructors & Officials	33,854

3. From the table below, (a) Draw a broken line graph.
(b) Describe the trend.

NUMBER OF GRADUATING STUDENTS WHO SAID THEY WANTED TO BE AUTO MECHANICS
1953-1958

1953	24
1954	23
1955	22
1956	20
1957	17
1958	14

4. From the picture graph below, answer the following questions:

a) Among the students who study high school physics, approximately what is the ratio of boys to girls?

b) What is the approximate total enrollment in physics in the U. S.?

c) Can you tell from the graph exactly how many girls take physics?

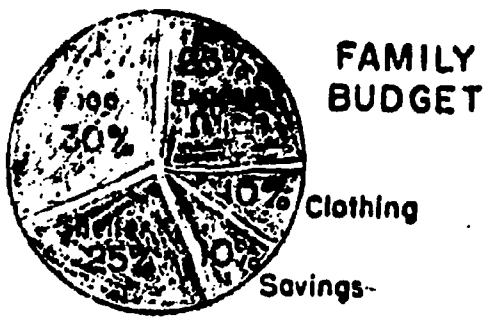
NUMBER OF HIGH SCHOOL PUPILS STUDYING PHYSICS
IN A CERTAIN YEAR IN THE U. S.

GIRLS: 

BOYS: 

Each symbol represents 10,000 pupils

5. Refer to the graph at the right:



a) How many cents of each dollar are budgeted for food?

b) How many cents of each dollar are set aside for saving?

c) What two items together account for more than half the family budget?

6. Define the following terms:

a) table -

b) graph -

c) axis -

References

I. Books

1. Brown, Simon, Snader, General Mathematics, Book Two, Laidlaw Brothers, 1968.
2. Brown, Simon, Snader, General Mathematics, Book One, Laidlaw Brothers, 1968.
3. McSwain, Brown, Gundlack, Cooke, Mathematics 8, Laidlaw Brothers, 1965.

II. Audio

Wollensak Teaching Tapes

C3051 Rounding Off: Whole Numbers

C3052 Rounding Off: Fractions to Whole Numbers

C3053 Rounding Off: Fractions to Fractions

C3054 Rounding Off: Decimals

C3151 Introduction to Per Cent

C3152 Changing Fractions to Per Cent

C3155 Changing Per Cent to Fractions

C3154 Changing Per Cent to Decimals

C3157 Changing Decimals to Per cent

C3301 Understanding Decimals

C3437 Converting to Base 10

C3438 Converting to Base 10

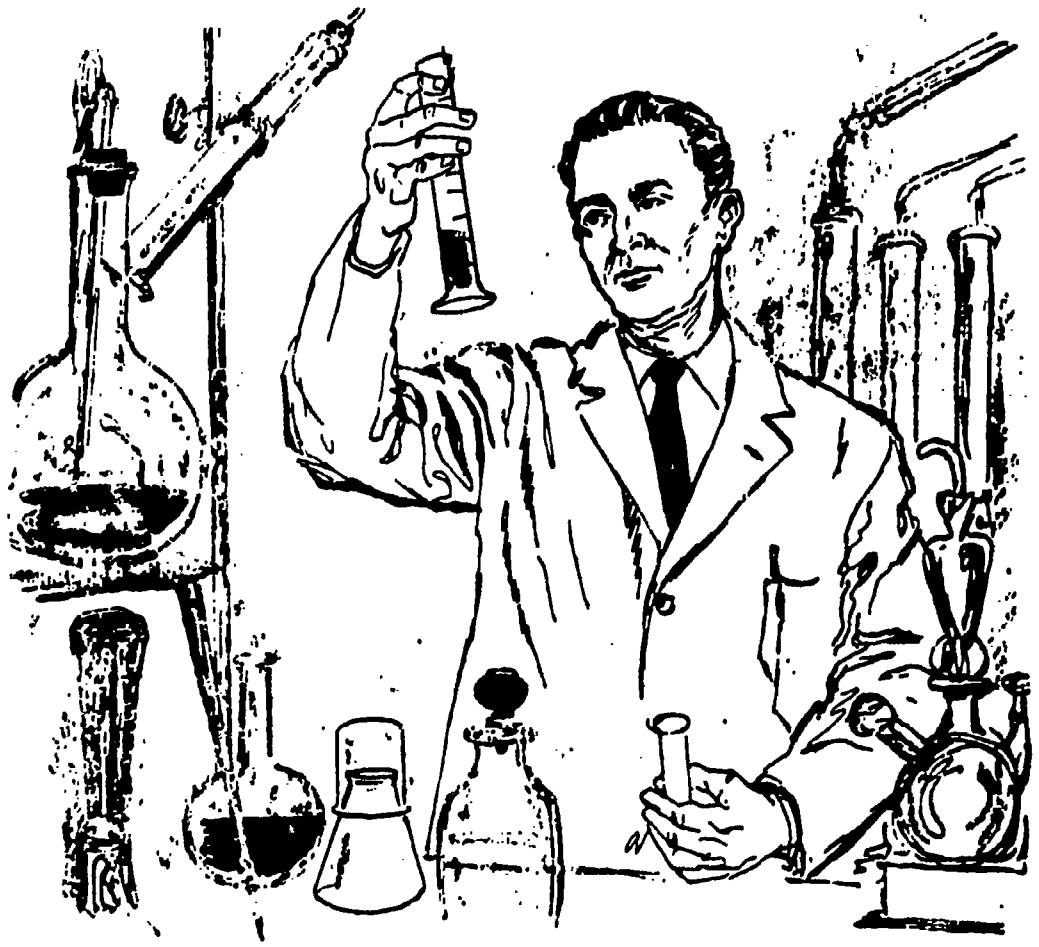
C3432 The Decimal System

LAP

LEARNING

ACTIVITY

PACKAGE



Ninety Six High School · Ninety Six, S.C.

MATHEMATICS and YOUR JOB

GENERAL MATH 102

REVIEWED BY

LAP NUMBER 14

WRITTEN BY James E. Byers

RATIONALE

If you look at magazines, newspapers, and other publications, you will find many tables of numeriacal facts. These facts are pictured for easier reading and understanding. These tables and graphs may deal with statistics (numerical facts) about population, business, government, and sports.

It is important that you know how to gather facts from these sources, how to organize such facts, and how to read and interpret these facts to draw proper conclusions.

This LAP will not only give you a brief view of statistics but will also help you re-explore some fundamental mathematical ideas. It will show you how statistical methods and procedures can be used to enrich your life and make many everyday mathematical experiences more meaningful.

MATHEMATICS AND YOUR JOB

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

1. Given a group of numbers find the mean (average).
2. Given a group of numbers find the median.(middle number)
3. Given a group of numbers find the mode. (number that occurs most often)
4. Construct a frequency table from given data.
5. Define the following:

a. central tendency	f. interval
b. mean	g. tally mark
c. mode	h. frequency table
d. median	i. mid-point
e. frequency	j. statistics

RESOURCES

I. Reading and Problems

General Math II - #1, pp. 69-72, ex. 1-10 pp. 72 & 73, pp. 73-75, ex. 11-19 p. 76: #2, pp. 80-83, ex. 1-10 p. 83: #1,2,3, pp. 84-87, ex. 5 p. 88: #1,2 pp. 89-91, ex. 1-7 pp. 92 & 93: #4, pp. 77-78, ex. 1-10 pp. 79 & 80: #5 p. 85-87, ex. 1-8, pp. 87 & 88.

General Math I - #1, pp. 250-251, ex. 1-4 p. 251: #2, pp. 246-248, ex. 1-9 pp. 248 & 249: #3 pp. 241-245, ex. 2, 5b, 6b, 7b, & 8b pp. 245 & 246: #4, pp. 241-257, ex. 5a, 6a, & 7a pp. 245 & 246, ex. 9a, 10a, 11a, 12a p. 249, ex. 5,6,7,8,9a,10a,11a,12a pp. 252 & 253: #5, p. 294, ex. 1-10 p. 294.

Mathematics 8 - #1,2,3, pp. 328 & 329, ex. 1-4, p. 329: #4, p. 323 & 324, Ex. ___: #5, ___ .

Self-Evaluation

Find the mean of the data given in examples 1 - 5.

1. 38, 49, 63, 24, 13, 36

2. 395, 468, 875, 968, 774, 688

3. $4.23, $7.80, $13.36, $5.65, $8.93

4. $71.38, $68.94, $87.37, $45.68, $91.38

5. 210 lbs., 243 lbs., 228 lbs., 260 lbs., 223 lbs., 239 lbs., 222 lbs.

From the tables find the (a) median and (b) mean.

6.

WEEKLY WAGES PAID BY THE THRIFT COMPANY

Interval	Frequency
95-99	2
90-94	1
85-89	3
80-84	3
75-79	3
70-74	4
65-69	5

Self-Evaluation (cont')

7. Find the median and mean.

SCORES ON AN ENGLISH TEST OF THE SENIOR CLASS

Scores	Number
95-99	8
90-94	6
85-89	20
80-84	10
75-79	4
70-74	1
65-69	1

Find the mode in the following examples:

8. 10, 12, 5, 4, 7, 6, 7, 4, 2, 7, 1, 2, 3, 10, 1, 7, 5, 4

9. 100, 100, 95, 55, 20, 95, 30, 15, 7, 9, 95, 2, 8, 5, 1, 93

10. Make a frequency table of the following information:

$80, $60,$55, $75, $45, $80, $80, $40, $55, $80, $75, $95, $60, $45, $95, $60, $85, $80, $60, $45, $80, $75, $60, $95, $90, $40, $55, $95, $80, $45, $40, $75, $60, $95, $70, $70, $100, $80, $55, $90

Self-Evaluation (cont')

11. Write the definitions of the following terms:

    a. central tendency

    b. mode

    c. mean

    d. median

    e. frequency

    f. interval

    g. tally mark

    h. frequency table

    i. mid-point

    j. statistics

12. Given the following group of numbers, find the mean, mode, and median.

    2, 2, 2, 3, 4, 5, 6, 11

LEARNING ACTIVITY PACKAGE

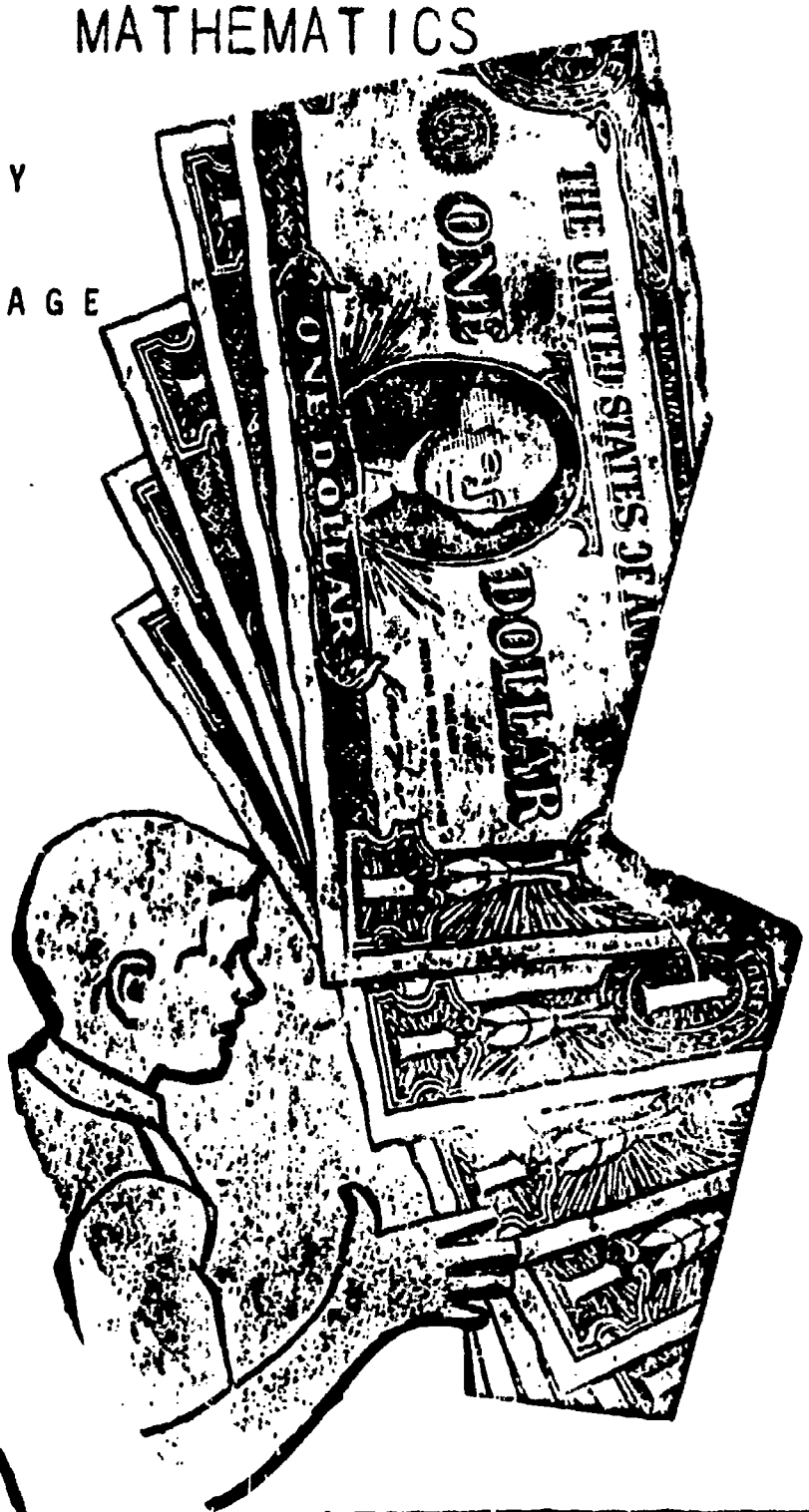
MATHEMATICS

HELPS

YOU

GET

PAID



Ninety Six High School
Ninety Six, S.C.

GENERAL MATH II 102

REVIEWED BY

LAP NUMBER 15

WRITTEN BY J.E. Byers

Rationale

The primary objectives of this chapter are to provide the students with a new look at the fundamental operations with whole numbers and to develop more skill with percent. It will also expand the student's understanding and and proficiency with mixed numbers.

Section I

Behavioral Objectives

Unless otherwise specified, you will be evaluated on the following by a work sheet, Progress and/or LAP Test.

1. Given any group of numbers you will be able to add them horizontally or vertically and check your addition. Correctness will determine your degree of accomplishment.
2. Given any two sets of numbers, estimate their product, then actually compute it.
3. Given any number, multiply it by ½ or divide by 2.
4. Given a number, find any specific percent of it.
5. Given an income tax withholding table, find the income to withhold from a specific amount of earnings after being given the number of exemptions permitted.
6. Given a social security table, find the social security to be withheld from a specific amount of earnings.
7. Given necessary information and tables, compute a payroll.
8. Given necessary information and tables, work out a currency break-down and a currency memorandum for a given payroll
9. Define the following:
   (a) horizontal addition
   (b) quotient
   (c) product
   (d) associative law for multiplication and addition
   (e) commutative law for multiplication and addition
   (f) mixed number
   (g) integer
   (h) fraction

Resources

Reading and Problems

I. General Mathematics II: #1, pp. 99-100, ex. 1-24 pp. 100-101, pp. 101-103, ex.1-10 pp. 104-105: #2, pp. 105-107, ex. 1-12 pp. 107-109: #3, pp. 110-112, ex. 1-44 pp. 112-113: #4, pp. 113-115, ex. 1-24 p.115, pp. 115-117, ex. 1-26 p. 117, pp. 118-119, ex. 1-24 p. 120: #5,#6 pp. 120-124, ex. 1-28 p.125: #7, pp.125-126 ex. 1-12 pp. 126-127: #8, pp. 128-129 ex. 1-6, pp. 130-131: #9, p. 137.

II. General Math I: #1, #2, #3,___: #4, pp. 227-228, ex. 1-30 pp. 228-229: #5 pp. 422-425, ex. 1-16 pp.425-426, pp.427-429, ex. 1-20 pp. 429-430: #6, pp. 418-420, ex.1-14 p. 420 #7, #8, #9,_____.

III. Mathematics 8 (Junior High School): #1, #2,#3,____: #4. p.152, Ex. 1-28, p. 153, ex. 1-15 p. 365: #5, #6,___: #7,#8,____ #9,____.

At the completion of behavioral objectives #3, 6, and 9, see the instructor for additional worksheets.

Audio:

Wollensak Teaching Tape - Associative law for Multiplication and Addition - C 3454.

Wollensak Teaching Tape - Commutation Law for Multiplication and addition - 3453.

See the instructor for worksheets before listening to tapes

Vidio:

Self-Evaluation

Add and check. Explain the principle upon which your check is based.

1. 8976
   9867
   3789
   7869

2. 9897
   7869
   8967
   7898

Perform the indicated operations:

3. a. 4+2+3+5+3=
   b. 7+3+5+2+8=
   c. 9+3+3+7+8=
   d. 4+6+5+7+6=
   e. 7+9+8+6+9=

4. a. 9+8+7+6+9=
   b. 8+9+7+9+8=
   c. 9+7+8+9+7=
   d. .9+.8+.5+.8+.9=
   e. 29+36+27+98+19=

5. a. 40 hours at $1.47 an hour
   b. 47 hours at $1.89 an hour
   c. 39 hours at $0.97 an hour

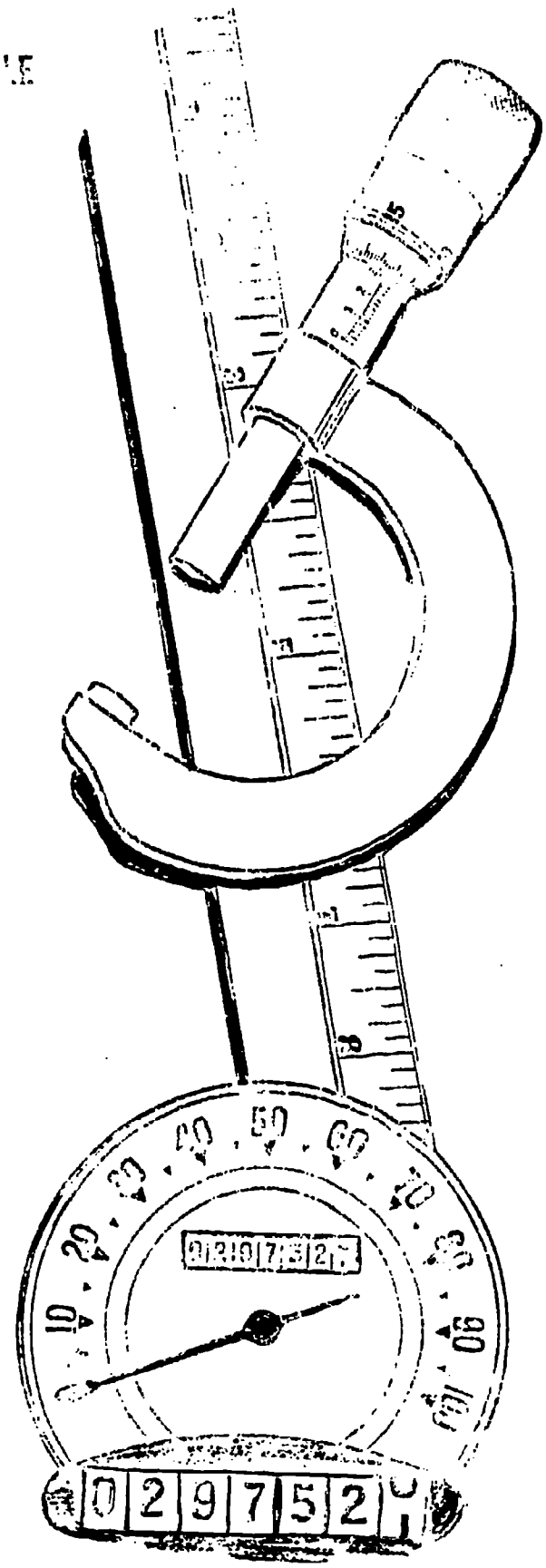
6. a. 39 hours at $1.96 an hour
   b. 46 hours at $1.79 an hour
   c. 49 hours at $1.69 an hour

7. a. 12% of $300
   b. 7% of $760
   c. 19% of $890

8. a. 17% of $987
   b. 1½% of $300
   c. 145% of $400

LAP

LEARNING ACTIVITY PACKAGE



MEASUREMENT AT WORK

GENERAL MATH 102

REVIEWED BY

LAP NUMBER 16

WRITTEN BY J. E. Byers

RATIONALE

The primary objectives of this LAP are to guide the students to extend their skill and understanding of the operations with common and decimal fractions, to realize the need for standard units of measure, to understand the meaning of precision and accuracy, to become familiar with some instruments of measurement, and to become skilled in working with the metric system as well as the English system of measurement.

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

1. Measure an object and compare it with some other unit of measure.
2. Read a ruler.
3. Distinguish between approximate and exact measurement.
4. Measure an object and express it as a mixed number or an improper fraction.
5. Change any given improper fraction to a mixed number and vice-versa.
6. Determine maximum error in measurement.
7. Given a fraction, produce equal fractions.
8. Given any list of fractions, factor and reduce them.
9. Given any list of fractions; add, subtract, multiply, and divide them.
10. Determine the accuracy and the number of significant digits in a measurement.

RESOURCES

I. Reading and Problems.

1. General Mathematics II: #2, pp. 141-143, ex. 1-40 pp. 144 & 145: #3, pp. 145-147, ex. 1-38 pp. 147-148: #4, pp. 148-149, ex. 1-28 p. 150: #5, pp. 150-151, ex. 1-10 p. 151: #6, pp. 151-152, ex. 1-22 p. 153: #7, pp. 153-154, ex. 1-32, p. 155: #8, pp. 155-156, ex. 1-34 p. 157: #9, pp. 157-159, ex, 1-34 pp. 159 & 160, pp. 160-162, ex. 1-26 p. 162, pp. 163-164, ex. 1-34 p. 165, pp. 165-167, ex. 1-40 pp. 167 & 168: #10, pp. 169-170, ex. 1-20 p. 170.

2. General Math I: #1, p. 165, ex. 1-30 pp. 165 & 166: #2, pp. 13-15, ex. 1-18 pp. 15 & 16: #3, pp. 123-125, ex. 1-26 pp. 125 & 126: #4, #5: pp. 156-157, ex. 1-30 p. 158: #6, pp. 185-186, ex. 1-16 p. 187 & 188: #7, pp. 132-133, ex. 1-30 p. 133: #8, p. 134, ex. 1-28 p. 134, pp. 153-155, ex. 1-38 p. 155: #9, pp. 135-137, ex. 1-28 pp. 137 & 138, pp. 138-140, ex. 1-14 p. 140, p. 141, ex, 1-28 p. 142, pp. 143-146, ex. 1-36 p. 146, pp. 147-149, ex. 1-16 p. 149, pp. 150-151, ex. 1-24 pp. 151 & 152: #10, pp. 188-190, ex. 1-16 p. 190, pp. 234-235, ex. 1-26 p. 236.

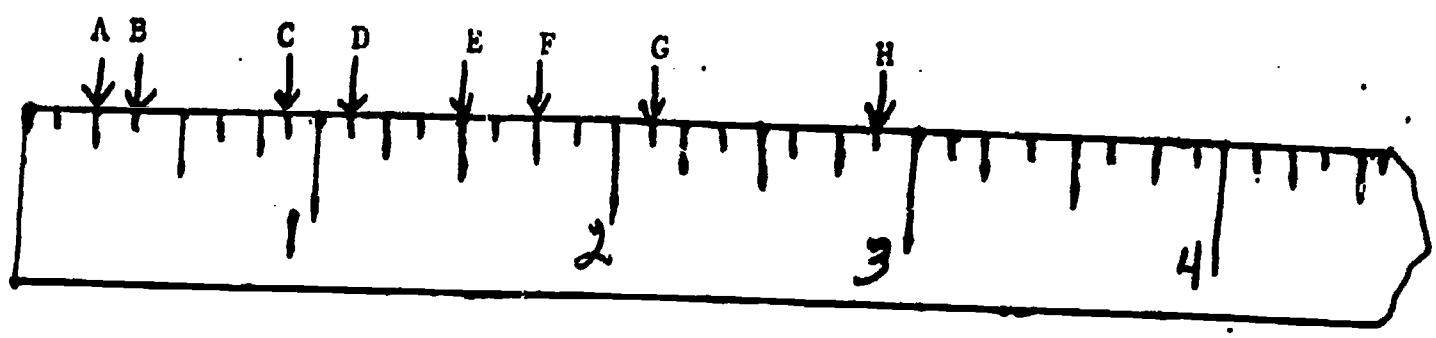
3. Junior High School Mathematics 8: #1, #2, #3, ____: #4, pp. 122-123, ex. 1-8 p. 123, p. 124, ex. 1-14 p. 125: #5, #6, pp. 164-165, ex. 7-11 p. 165: #7, p. 91, ex. 1-5 p. 91: #8, ____: #9, pp. 98-99, ex. 1-9 p. 99, pp. 104-105, ex. 1-9 p. 105, pp. 106-107, ex. 1-7, p. 11, ex. 1-5 p. 111: #10, pp. 166-167, ex. 1-9 p. 167, pp. 168-169, ex. 1-12 p. 169.

* You are to see the instructor for a work sheet at the completion of behavioral objective 5 and at the completion of behav. obj. 10.

With your ruler find the lengths of these lines to the nearest ⅛".

1. _____ 2. _____ 3. _____ 4. _____

In exercises 5-12 read the distance from the left edge of the ruler to a point on the upper edge of the ruler directly below the capital letter involved.



Express the distance in several ways where possible.

5. distance to A

6. distance to B

7. distance to C

8. distance to D

9. distance to E

10. distance to F

11. distance to G

12. distance to H

Tell whether the numbers used in exercises 13-16 are approximate or exact, and give reasons.

13. 14 boys

14. 12 books

15. Jim weighs 108 pounds.

16. Henry is 5'9".

Change these mixed numbers to improper fractions:

17. $3\frac{1}{4}$

18. $5\frac{3}{8}$

19. $2\frac{1}{16}$

20. $3\frac{7}{8}$

21. $4\frac{3}{5}$

Change these improper fractions to mixed numbers:

23. $\frac{7}{2}$

24. $\frac{17}{4}$

25. $\frac{21}{8}$

26. $\frac{29}{16}$

27. $\frac{8}{3}$

28. $\frac{40}{8}$

Replace the question mark with the proper numerals:

29. $\frac{1}{4} = \frac{?}{8}$

30. $\frac{3}{4} = \frac{?}{16}$

31. $\frac{9}{10} = \frac{?}{100}$

32. $\frac{3}{5} = \frac{?}{100}$

SECTION II

Learning Goals

At the completion of your prescribed course of study, you will be able to:

11. Determine the tolerance (upper & lower limits) of a specific measurement.

12. Add and subtract decimals.

13. Use a micrometer caliper along with multiplying decimals.

14. Given a list of common fractions, change them to decimal fractions and vice-versa.

15. Complete a table of decimal and common fraction equivalents.

16. Divide decimal fractions.

17. Change one metric unit to other metric units.

18. Change metric values to English equivalents.

19. Define the following:

    a. measurement
    b. international standard unit of length
    c. meter
    d. approximate numbers
    e. precision
    f. mixed numbers
    g. improper fractions
    h. maximum error in measurement
    i. factors
    j. significant digits

RESOURCES

I. Reading and Problems.

1. General Mathematics II: #11, #12, pp. 171-173, ex. 1-22 pp. 173 & 174: #13, pp. 174-176, ex. 1-26 pp. 176-178: #14, pp. 178-180, ex. 1-33 pp. 180 & 181, pp. 181-182, ex. 1-38 p. 183: #15, pp. 183-184, ex. 1-28 pp. 184 & 185: #16, pp. 185-188, ex. 1-34 pp. 188 & 189: #17, pp. 189-190, ex. 1-30 pp. 191-192: #18, pp. 192-193, ex. 1-30 p. 193: #19, p. 201, ex. 1-10.

2. General Mathematics I: #11, pp. 200-201, ex. 1-22 p. 201: #12, pp. 177-179, ex. 1-16 pp. 179 & 180: #13, pp. 197-198, ex. 1-12 p. 199, pp. 177-179, ex. 17-22 p. 179: #14, pp. 180-181, ex. 1-20 pp. 181 & 182, pp. 171-175, ex. 17-32 p. 175: #15, ____: #16, pp. 177-179, ex. 23-28 p. 180: #17, pp. 202-204, ex. 1-18 pp. 204 & 205: #18, pp. 205-206, ex. 1-22 pp. 206 & 207: #19, p. 210, ex. 7, 8, & 9.

3. Junior High School Mathematics 8: #11, ____: #12, pp. 104-105, ex. 1-9 p. 105: #13, ____: #14, pp. 140-141, ex. 1-4 p. 141: #15, ____: #16, #17, #18, #19, ____.

* You are to see the instructor for a work sheet at the completion of learning goals 13. 16, and 18.

SELF-EVALUATION II

State the upper and lower limits of the following measurements.

1. 8"
2. 4.2"
3. 0.002"
4. 9'
5. 9½'
6. 0.12'

Change these common fractions to decimal fractions:

7. $\frac{3}{4}$
8. $\frac{3}{8}$
9. $\frac{3}{25}$

Change these decimal fractions to eighths:

10. .375
11. .24
12. .04

Add the following decimal fractions:

13. 8.36 + 7.15
14. 9.14 + 2.67
15. 5.42 + 3.27

Subtract the following decimal fractions:

16. 9.82 − 4.16
17. 5.32 − 2.19
18. 8.63 − 4.87

SELF-EVALUATION II (cont')

Multiply the following decimal fractions:

19. $\begin{array}{r} .097 \\ \times .17 \\ \hline \end{array}$

20. $\begin{array}{r} 2.094 \\ \times .18 \\ \hline \end{array}$

21. $\begin{array}{r} 5.03 \\ \times .62 \\ \hline \end{array}$

Divide the following decimal fractions:

22. $.5\overline{)1.60}$

23. $.6\overline{)36.12}$

24. $.24\overline{)9.6}$

Change the following metric units to the designated metric units.

25. _____ cm. = 1 dm.

26. _____ mm = 1 dm.

27. _____ cm. = 1 km.

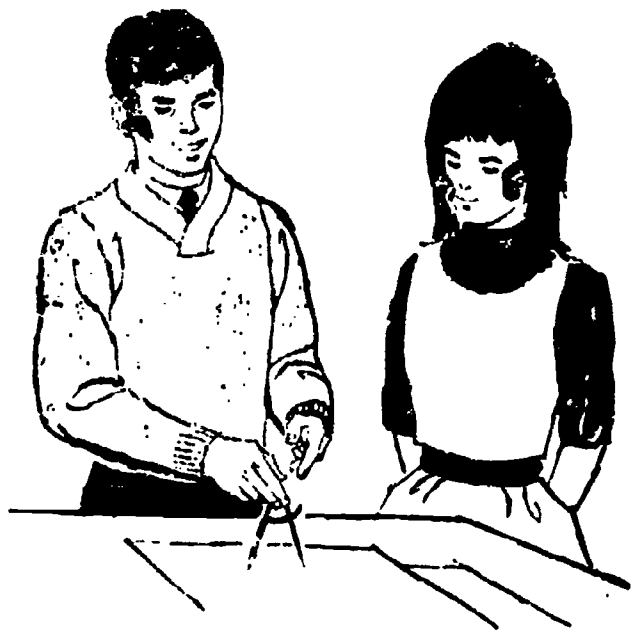
Change the following metric units to English equivalence:

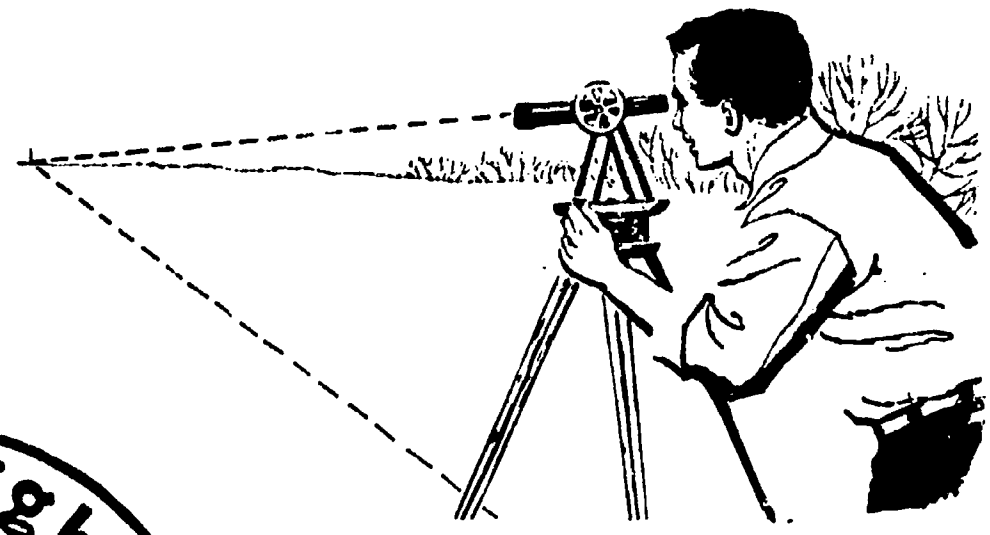
28. 20 cm. = _____ in.

29. 35 mm. = _____ in.

30. 3 km. = _____ miles

LEARNING ACTIVITY PACKAGE





BASIC IDEAS OF GEOMETRY AT WORK

Ninety Six High School · Ninety Six, S.C.

General Math II

REVIEWED BY JR

LAP NUMBER 17

WRITTEN BY J. E. Byers

RATIONALE

One morning as Mr. Johnson was walking to school, he passed some construction work. He saw the workman using many ideas taken from geometry. A carpenter was dividing a board into seven equal parts by using an idea based upon parallel lines. The foreman was examining a blueprint which draws heavily from geometry. Geometric forms such as rectangles and triangles could be seen throughout the construction.

The primary objectives of this LAP are to give the student an opportunity to become familiar with the common geometric forms and deductive reasoning in our everyday thinking.

SECTION I

Behavioral Objectives:

At the completion of your prescribed course of study, you will be able to:

1. Distinguish between a solid, plane, line, and point by stating the geometric definition of each.
2. Draw an acute, right, obtuse, or straight angle.
3. Name an angle or angles from a given diagram.
4. Use a protractor to measure an angle of any given size.
5. Use a protractor to construct perpendicular lines.
6. Use a protractor or ruler to construct parallel lines.
7. Given two lines, determine whether or not they are parallel by cutting them with a transversal.
8. Distinguish between alternate interior angles and corresponding angles from a given diagram.
9. Use a protractor to construct equal angles of any given size.
10. Use a compass to construct equal angles of any given size.

*See the instructor for additional worksheets at the completion of Behavioral Objectives 5 and 10.

RESOURCES (Reading and Problems)

I. General Math II - #1, pp. 203-204, ex. 1-12 p. 204: #2 & #3, pp. 205-206, ex. 1-22 pp. 207 & 208: #4, pp. 208-209, ex. 1-20 pp. 209 & 210: #5, pp. 210-211, ex. 1-10 p. 212: #6, pp. 213-214, ex. 1-14 pp. 214-215: #7 & #8, pp. 215-217, ex. 1-20 pp. 217 & 218: #9 & #10, pp. 219-220, ex. 1-12 p. 221.

II. General Math I - #1, pp. 17-22, ex. ___: #2, pp. 53-55, ex. 1-9 pp. 55 & 56: #3, pp. 23-25, ex. 1-8 pp. 25 & 26: #4, pp. 27-29, ex. 1-12 p. 30: #5 & #6, ___: #7, pp. 45-47, ex. 1-6 p. 48: #8, ___: #9 & #10, pp. 39-41, ex. 1-10, pp. 41 & 42.

III. Junior High School Mathematics 8 - #1, pp. 181-183, ex. 1-5 p.183: #2, pp. 192-193, ex. 1-3 p. 193: #3 ___: #4 & #5, ___: #6, pp. 202-203, ex. 3 p. 203: #7, ___: #8, #9, & #10, ___.

SELF-EVALUATION 1

1. How many plane surfaces enclose the solid in figure 1?

2. How many line segments can you find in Fig. 1?

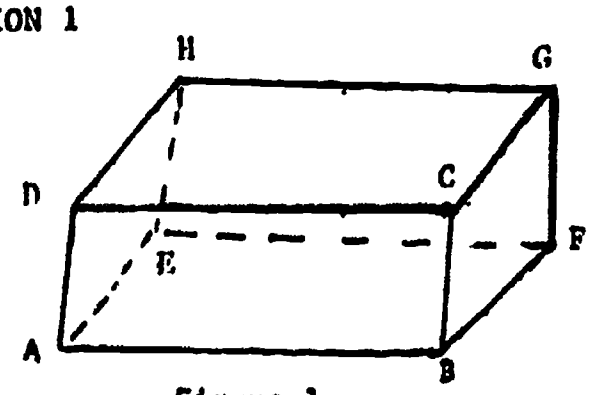


Figure 1

3. Draw an acute, right obtuse, and straight angle.

4. Name the three angles in figure two using three letters each time.

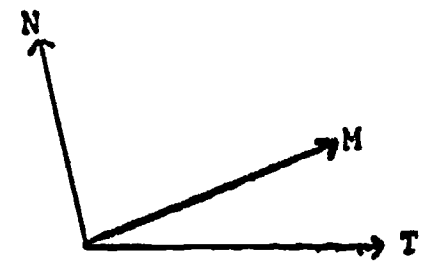
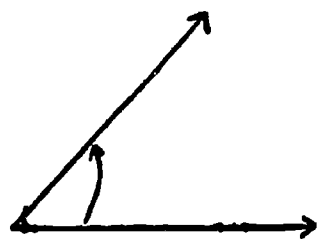


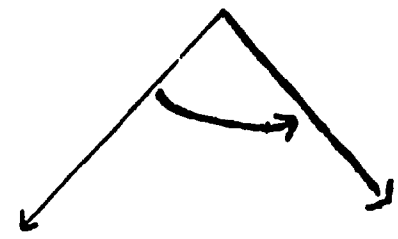
Figure 2

5. Find the number of degrees in the following angles.

(a)

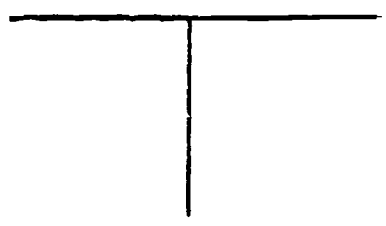


(b)

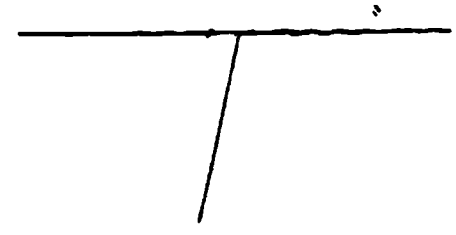


6. Use a protractor to determine which lines are perpendicular.

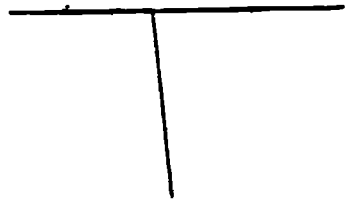
(a)



(b)



(c)



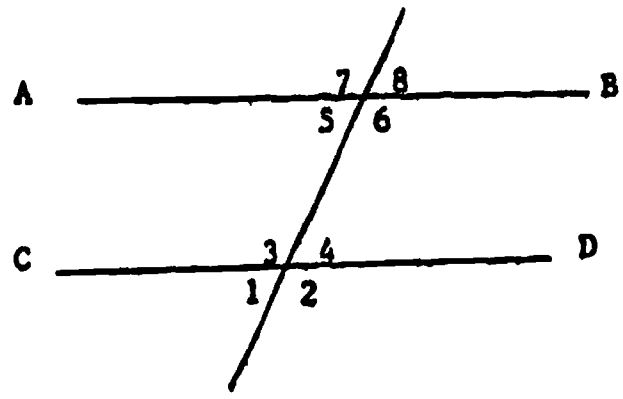
7. Draw a line. Construct a line parallel to this line and 2" from it.

8. (a) ∠6 and ∠____ are alternate interior angles.

   (b) ∠5 and ∠____ are alternate interior angles.

   (c) ∠7 and ∠____ are corresponding angles.

   (d) ∠5 and ∠____ are corresponding angles.



9. Draw an angle of 50 degrees and construct an angle equal to it with a protractor and then with a compass.

Behavioral Objectives:

At the completion of your prescribed course of study, you will be able to:

11. Construct a line parallel to a given line through a given point.

12. Divide a line of given length into a given number of equal parts.

13. Determine whether or not two given geometric figures are congruent by their size and shape.

14. Measure the necessary parts of two given triangles to show whether or not the triangles are congruent.

15. Construct a congruent triangle from a given triangle with the use of a compass.

* A drawing notebook is required after the completion of learning goal 15. It will consist of 2 drawings each from learning goal 11, 12, 14, and 15. You will have two days after you complete learning goal 15 to pass this notebook in.

16. Write the ratio of two given numbers.

17. Write three pairs of numbers equal to a given ratio.

18. Identify the means and the extremes of a given proportion.

19. Determine whether or not two given ratios are equal.

20. Set up a given exercise as a proportion and solve it.

21. Tell whether or not two given triangles are similar.

RESOURCES (Reading and Problems)

I. General Math II - #11, pp. 221-223, ex. 1-6 p. 223: #12, pp. 224-226, ex. 1-20 p. 227: #13 & #14, pp. 228-230, ex. 1-18 pp. 231 & 232: #15, pp. 232-235, ex. 1-10 pp. 235 & 236, pp. 237 - 238, ex. 1-10 pp. 238 & 239: #16, #17 pp. 240-242, ex. 1-12 pp. 242 & 243: #18, #19, pp. 243-245, ex. 1-21 p. 245: #20, pp. 245-247, ex. 1-10 p. 247: #21, pp. 248-251, ex. 1-22 pp. 251-252.

II. General Math I - #11, pp. 45-47, ex. 7-10 p. 49: #12, pp. 50-51, ex. 1-18 pp. 51 & 52: #13,#14, & #15, ___: #16, pp. 213-214, ex. 1-20 p. 215: #17, ___: #18, pp. 352-355, ex. 1-16 pp. 355 & 356: #19, pp. 216-217, ex. 1-24 pp. 217 & 218: #20, pp. 216-217, ex. 25-28 p. 218: #21, ___.

III. Junior High School Mathematics 8 - #11,#12, & #13, ___: #14, p. 195-197, ex. 1-5 p. 197, pp. 198-199, ex. 4-8 p. 199: #15, ___: #16, #17, #18, #19, & #20, pp. 148-149, ex. 1-15 p. 149: #21, pp. 230-231, ex. 1-3 p. 231, pp. 232-233, ex. 1-4 p. 233.

SELF-EVALUATION 2

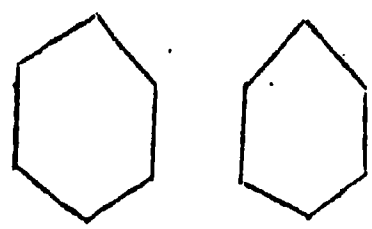
1. Construct a line parallel to the following line through point C.

2. Divide a 4" line into 4 equal parts.

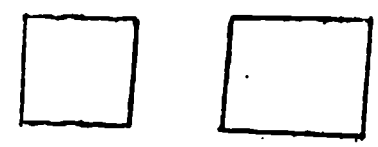
3. Divide a 2½" line into 4 equal parts.

4. Tell whether or not the following pair of figures appear to be congruent.

(A)



(B)



5. Draw a triangle. Construct a triangle congruent to it.

6. Write the following in ratio form.

(a) $20 to $50

(b) 3" to 4"

(c) $50 to $20

(d) 4" to 3"

7. Write three pairs of numbers whose ratio is $\frac{1}{3}$ or 1:3.

8. **Identify the means and the extremes of the following proportions.**

(a) $\frac{1}{2} = \frac{2}{4}$ (b) $\frac{3}{4} = \frac{6}{8}$ (c) $\frac{2}{3} = \frac{6}{9}$

9. Determine whether or not the following ratios are equal.

(a) $\frac{3}{4}, \frac{9}{12}$

(b) $\frac{3}{10}, \frac{6}{10}$

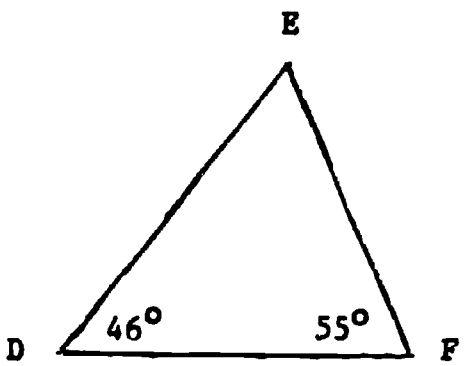
(c) $\frac{6}{18}, \frac{3}{9}$

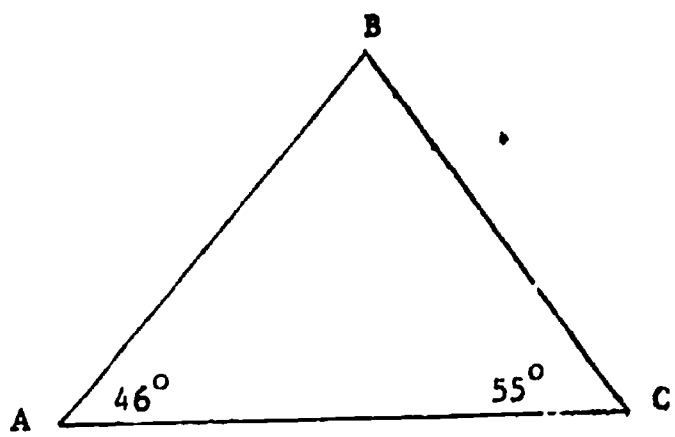
10. Set up each exercise as a proportion and solve.

a. If 2 grapefruit cost 19¢, find the cost of 6 grapefruit .

b. If shirts sell at 2 for $5.00, find the cost of a dozen.

11. Tell whether or not the following triangles are similar and give a reason for your answer.





SECTION 3

Behavioral Objectives:

At the completion of your prescribed course of study, you will be able to:

22. Use inductive reasoning to draw conclusions from measurements. (Hint: use a diagram)

23. Use deductive reasoning to test the validity of given arguments and also use a diagram to show the results.

24. Use the definitions, assumptions, and reasoning found on pages 276 & 268 to prove triangles are congruent. (in your General Math II book)

* See the instructor for further instructions before you go into Behavioral Objective 24.

25. Define, explain, or match the following terms:

    a. perpendicular lines
    b. parallel lines
    c. congruent
    d. vertical angles
    e. isosceles triangle
    f. transversal
    g. similar
    h. parallelogram
    i. ratio
    j. acute angle

RESOURCES (Reading and Problems)

I. General Math II - #22, pp. 254-256, ex. 1-10 pp. 256-258: #23, pp. 259-261, ex. 1-14 pp. 261-262, pp. 262-264, ex. 1-12 pp. 264-265: #24, pp. 267-271, ex. 1-20 pp. 271-273: #25, p. 279, ex. ___.

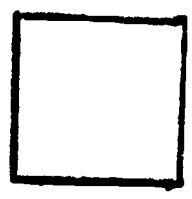
II. General Math I - #22, #23, #24, ___: #25, p. 66, ex. 7 & 10, p. 36, ex. ___.

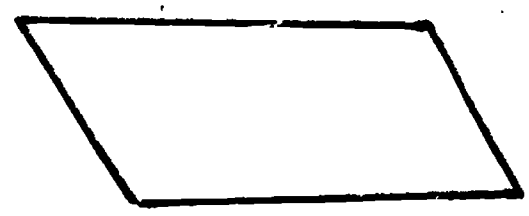
III. Junior High School Mathematics 8 - #22, pp. 23-25, ex. 1-5 p. 25, p. 22, ex. 1-13 pp. 26 & 27: #23, pp. 44-45, ex. 1-5 p. 45: #24, ___: #25, ___.

SELF EVALUATION 3

1. Show that the following are reasonable generalizations by measurements.

   (a) the sum of the angles of a quadrilateral is 360°. Use diagrams such as these.





   (b) If two sides of a triangle are equal, the angles opposite these sides are equal.

   (c) The sum of the acute angles of a right triangle is 90°.

2. Test the validity of the following arguments by using diagrams. By deductive reasoning, tell whether it is true or not.

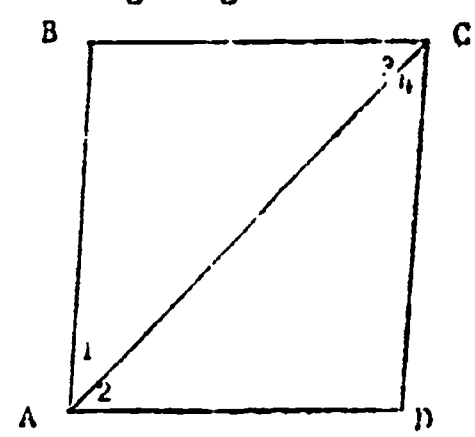
   (a) Data: All citizens of the United States are taxpayers.
   John is a citizen of the United States.
   Conclusion: John is a taxpayer.

   (b) Data: All fish swim.
   This animal is a fish.
   Conclusion: This animal can swim.

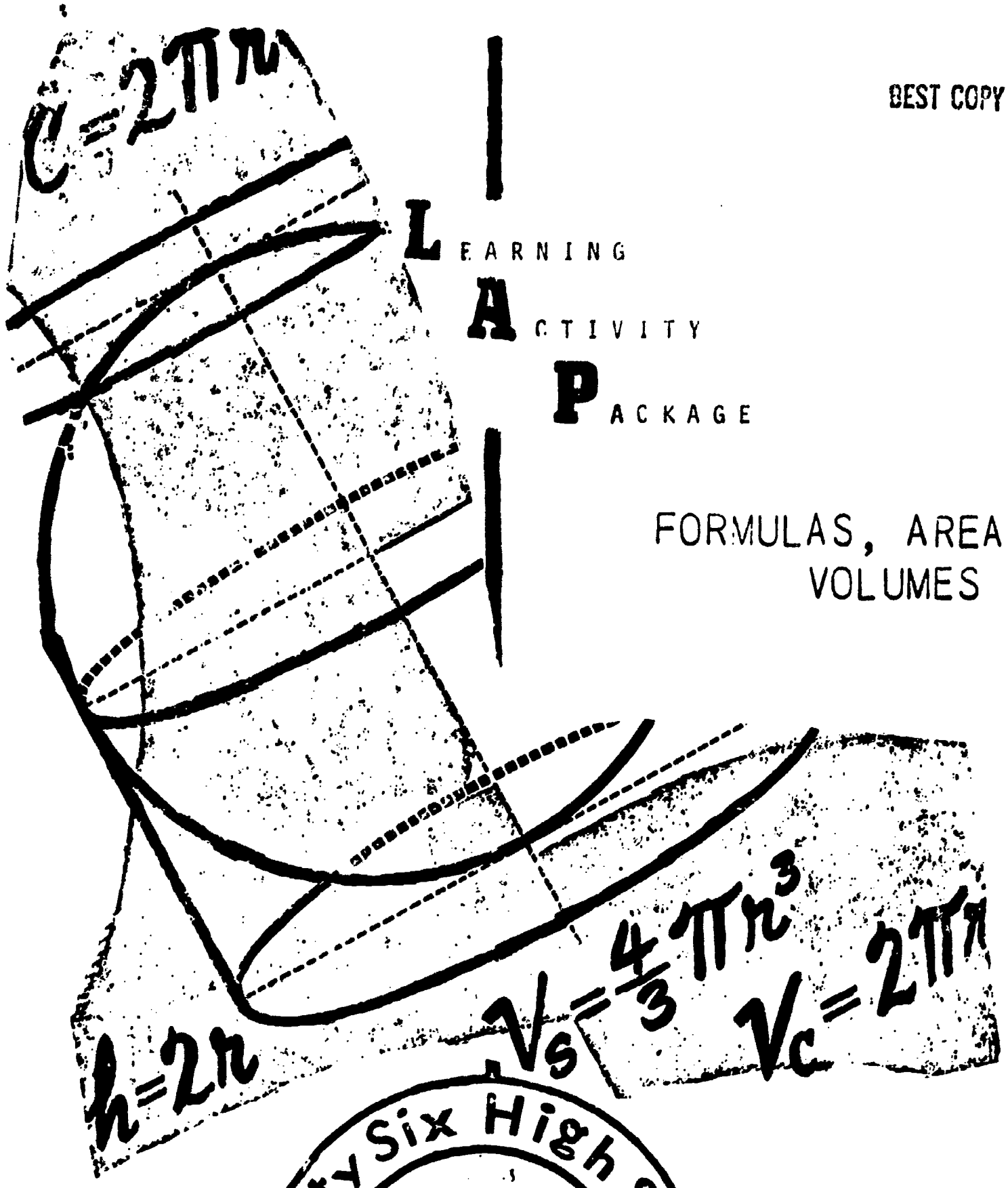
3. Prove the congruence of the triangles in the following diagram.

   (a) Data: $BC = AD$ and $\angle 3 = \angle 2$
   PROVE: $\triangle ABC \cong \triangle ACD$

   (b) Data: $BC = AD$ and $AB = CD$
   PROVE: $\triangle ABC \cong \triangle ACD$



LEARNING ACTIVITY PACKAGE



FORMULAS, AREAS, AND VOLUMES

Ninety Six High School · Ninety Six, S.C.

General Math II

REVIEWED BY

LAP NUMBER 18

WRITTEN BY J E Byers

RATIONALE

In this LAP the student will deal with some particular formulas, those of area and volume. The primary objectives are to have the students realize the value of a formula, to review the learning of the four operations with whole numbers and common and decimal fractions, and to have the students become familiar with the units used in measuring areas and volumes.

SECTION 1

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

1. Use a formula to get a quick, accurate way of showing relationships.
2. Find the perimeter of any polygon given the lengths of all sides.
3. Find the circumference of a circle with a given diameter.
4. Find the circumference of a circle with a given radius.
5. Find the area of any given polygon using the correct formula and given the base and height.
6. Use correct formulas to find the circumference of a circle, the area of a rectangle, and to complete a given table. You will be given the base and height of the rectangle and the diameter or radius of the circle.
7. Write formulas from a given statement.
8. Use a given formula to find the area of a square given one side.
9. Use a given formula to find the area of a parallelogram given the base and height.
10. Use a given formula to find the area of a triangle given the base and height.
11. Use a given formula to find the area of a trapezoid given the height and both bases.
12. Use a given formula to find the area of a circle given π and the radius.
13. Find the radius or diameter of a circle given pi and the circumference.

* See the instructor for additional worksheets at the completion of Behavioral objectives 4, 5, and 12.
* See the instructor at the beginning of this LAP for a filmstrip on formulas and also an explanation of a circle.
* See the instructor for problems for behavioral objective 13.

RESOURCES

READING AND PROBLEMS.

General Math II - #1, p. 281, ex. ___: #2, pp. 281-284, ex. 1-20. pp. 284-286: #3 & #4, pp. 286-290, ex. 1-28 pp. 290 & 291: #5, pp. 291-292, ex. 1-16 pp. 292-294, pp. 294-296, ex. 1-30 pp. 296-299: #6 & #7, pp. 291-301, ex. 1-26 pp. 301 & 302: #8, pp. 302-304, ex. 1-30 pp. 304-306: #9, pp. 306-308, ex. 1-20 pp. 309 & 310: #10, pp. 311-312, ex. 1-22 pp. 313 & 314: #11, pp. 314-317, ex. 1-24 pp. 317-319: #12, pp. 319-321, ex. 1-30 pp. 322 & 323.

General Math I - #1, ___: #2, pp. 312-314, ex. 15-23 p. 316: #3 & #4 & #6 p. ___, ex. 24-28 p. 316: #5 & #6, pp. 316-319, ex. 1-20 pp. 320 & 321: #7, pp. 312-314, ex. 1-14 pp. 314 & 315: #8, #9, #10, & #11, ___: #12, p. 320, ex. 21-24 p. 321.

Junior High School Mathematics 8 - #1, ___: #2, p. 265, ex. 1-5 p. 265, pp. 266-267, ex. 1-14 p. 267: #3 & #4, p. 275, ex. 1-5 p. 275: #5, #6, #7, #8 ___: #9, p. 272, ex. 1-6 p. 272: #10, pp. 270-271, ex. 1-5 p. 271: #11, p. 273, ex. 1-5 p. 273: #12, pp. 276-277, ex. 1-7 p. 277.

SELF-EVALUATION 1

1. Find the perimeter of a triangle whose sides measure 6.1 in., 8.3 in., and 4.6 in.

2. Find to the nearest inch the circumference of a circle whose radius is 4.1 in. Use $\pi = 3.14$. Use $C = 2\pi r$

3. Find the area of a circle with a radius of 7.3" by using the formula $A = \pi r^2$.

4. What is the area of a square whose side is $2\frac{1}{2}$ units? Use $A = S^2$

5. Find the area of a parallelogram whose base is 3.8 ft. and whose altitude is 1.9 ft. Use $A = bh$

6. Find the area of a traingle whose dimensions are the same as those of the parallelogram in exercise 5. Use $A = \frac{1}{2}bh$

7. Find the area of a trapezoid whose bases measure 6 in. and 8 in. and whose altitude is 10 in. Use $A = \frac{1}{2}h\ (b_1 + b_2)$

8. If the radius of a circle is $2\ \frac{3}{4}$ in., how long is the diameter?

9. If the diameter of a circle is $3\frac{1}{2}$ in., how long is the radius?

10. Find the circumference of a circle whose diameter is 2.9". Use $C = \pi d$ where $\pi = 3.14$.

SECTION 2

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

14. Find the volume of a rectangular solid given the length, width, and the height. Use $V = LWH$

15. Find the volume of a cylinder given pi, the radius, and the height or the area of the base and height. Use $V = \pi r^2 h$

16. Find the volume of a pyramid given the base and height. Use $V = \frac{1}{3} Bh$

17. Find the volume of a cone given pi, the radius, and the height. Use $V = \frac{1}{3} \pi r^2 h$

18. Find the volume of a sphere given pi and the radius. Use $V = \frac{4}{3} \pi r^3$

RESOURCES

READING AND PROBLEMS

General Math II - #14, pp. 323-327, ex. 1-26 pp. 327-328: #15, pp. 328-330, ex. 1-20 pp. 330-331: #16, #17, & #18, pp. 331-335, ex. 1-28 pp. 335-337.

General Math I - #14, #15, #16, #17, & #18, pp. 322-325, ex. 1-24 pp. 325-326.

Junior High School Mathematics 8 - #14, pp. 278-279, ex. 1-14 p. 279: #15, pp. 284-285, ex. 1-3 p. 285: #16, pp. 282-283, ex. 1-3 p. 283: #17, pp. 286-287, ex. 1-3 p. 287: #18, pp. 288-289, ex. 1-3 p. 289.

SELF-EVALUATION 2

1. Find the volume of the rectangular solids whose dimensions are:

	LENGTH	WIDTH	HEIGHT
a)	6	8	4
b)	12	19	16
c)	8	6	$4\frac{1}{2}$

2. Find the volume of the cylinders given.

	RADIUS OF BASE	HEIGHT
a)	4.0"	6.0"
b)	10"	12"
c)	6.1"	9.7"

3. Find the volume of the pyramid given.

	AREA OF BASE	HEIGHT
a)	10 sq. in.	12 in.
b)	18 sq. in.	$6\frac{1}{2}$ in.
c)	56 sq. in.	1'2"

4. Find the volume of the cone given.

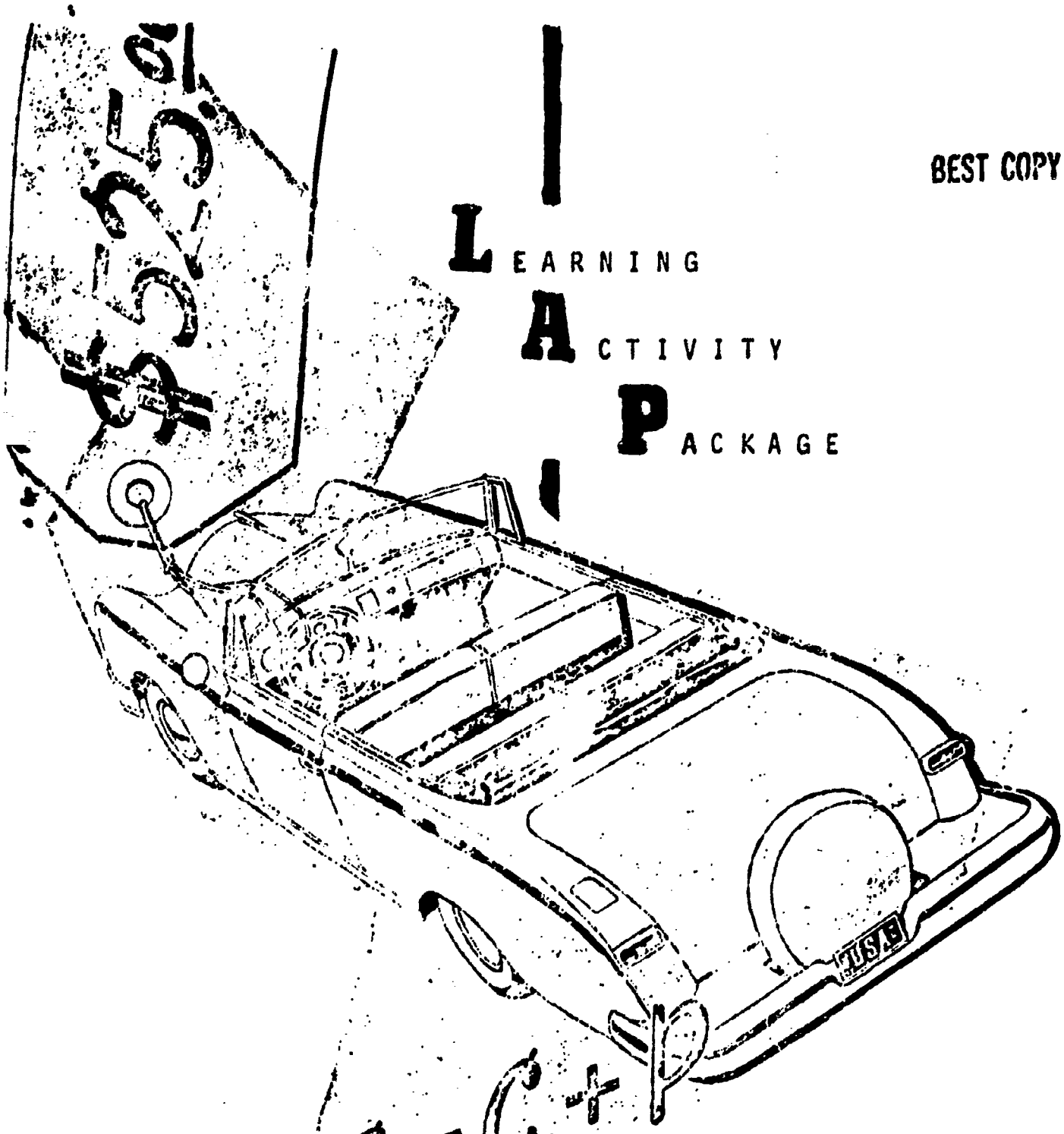
	RADIUS OF BASE	HEIGHT
a)	10 in	12 in.
b)	1 ft.	15 in.
c)	6.5"	2'

5. Find the volume of the sphere given.

a) radius = 10"
b) diameter = 20.4 cm.

LAP

LEARNING ACTIVITY PACKAGE



MAKING USE OF ALGEBRA

Ninety Six High School · Ninety Six, S.C.

General Math II

REVIEWED BY

LAP NUMBER 19

WRITTEN BY J E Byers

RATIONALE

Before we can understand the many uses of algebra, we must first become familiar with its language. In addition to the number symbols of arithmetic (1, 2, 3, 4,...) and signs of operations (+, -, x, ÷, $\sqrt{\ }$) algebra uses letters of the alphabet to help us in our thinking. The primary objectives are to extend the basic concepts of arithmetic through algebra and to give the student opportunities to translate ideas into symbols, to translate symbols into ideas, and to solve problems using algebraic methods.

SECTION 1

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

1. Given an algebraic expression, write it as a word statement.
2. Given a word statement, write it in algebraic form.
3. Given a specific arithmetic fact, state whether or not it is the commutative law for addition or multiplication and express in algebraic symbols.
4. Given a formula, state what value a specific variable depends upon.
5. Given a table of values, state the relationship of these values.
6. Using the rule for the order of operations, find the value of a given expression.
7. Given an equation with an unknown, find the solution by replacing the variable with the correct number.

RESOURCES

Reading and Problems

1. General Math II - #1, #2, pp. 347-348, ex. 1-30 pp. 348-349, pp. 353-354, ex. 1-20 pp. 354 & 355: #3, pp. 349-351, ex. 1-22 pp. 352 & 353: #4, #5, #6, pp. 355-357, ex. 1-20 p. 357: #7, pp. 358-360, ex. 1-30 p. 360.

2. General Math I - #1, pp. 308-309, ex. 1-24 p. 310: #2, pp. 305-307, ex. 1-26 pp. 307 & 308, pp. 310-311, ex. 1-18 pp. 311 & 312: #3, ___: #4, pp. 312-314, ex. 1-28 pp. 314-316: #5, ___: #6, pp. 302-304, ex. 1-34 pp. 304 & 305: #6, ___.

3. Junior High School Mathematics 8 - #1,#2,#3,#4,#5,#6, & #7 ___.

SELF-EVALUATION 1

What is the meaning of each of the following if N represents a number?

(1) 2N

(2) N + 1

Let N and M represent numbers. Represent the following:

(3) 3 more than a number

(4) 2 less than a number

Find the value of these expressions:

(5) 8 + 4 x 3

(6) 9 + 8 ÷ 2

Solve the following equations:

(7) 8 + M = 12

(8) N - 8 = 30

(9) 4N = 68

(10) $14 = \frac{N}{2}$

SECTION 2

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

8. Given an unsolved equation find the solution by using the indicated operations. (Use the order of operations rule when necessary).
9. Given an unsolved equation with like-terms, combine the like-terms, determine which operation or operations to use and solve. (Use the order of operations rule when necessary.)
10. Given an unsolved verbal problem, transform it into an equation, determine which operation or operations to use and solve. (Use the order of operations rule when necessary.)

RESOURCES

Reading and Problems

1. General Math II - #8, pp. 361-365, ex. 1-34 pp. 365 & 366, pp. 367-368, ex. 1-22 pp. 368-369, pp. 369-370, ex. 1-28 pp. 370 & 371, pp. 371-372, ex. 1-28 p. 372, pp. 372-374, ex. 1-42 p. 375, pp. 375-376, ex. 1-30 p. 377: #9, pp. 377-379, ex. 1-42 p. 379: #10, pp. 380-382, ex. 1-46 pp. 383 & 384.

2. General Math I - #8, #9, & #10, ___.

3. Junior High School Mathematics 8 - #8, pp. 136-137, ex. 1-8 p. 137, pp. 138-139, ex. 1-15 p. 139: #9 & #10, ____ .

SELF-EVALUATION 2

Solve the following equations:

(1) $12N - 19 = 7N + 6$

(2) $7x + 4 - x = 40$

(3) $5x - 4 = 2x + 8$

(4) $2N + 3N = 30$

(5) $6x + 3x = 36$

(6) $2N - N + 1 = 10$

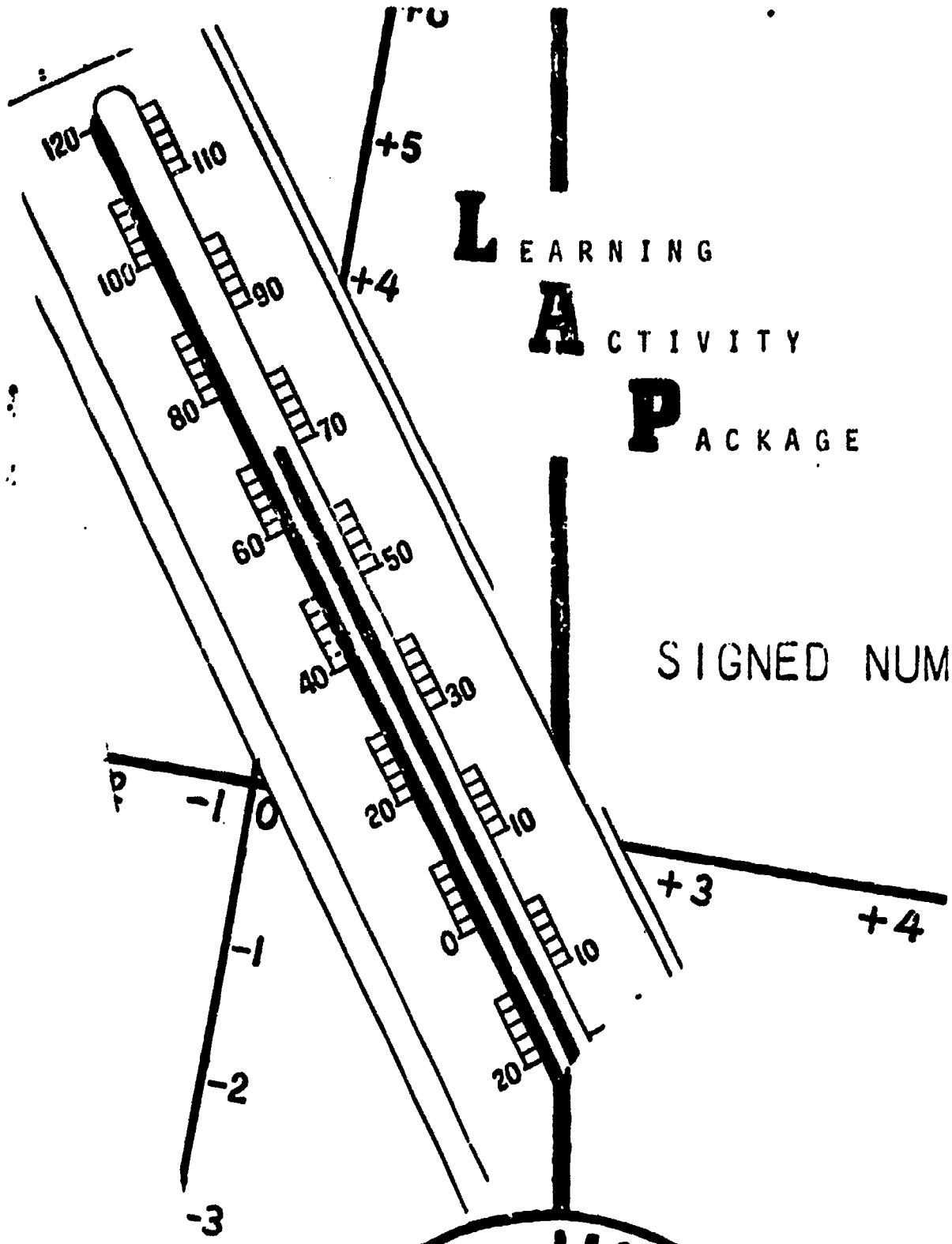
7. A man saves 5% of his salary each week. Find his salary if he saves $6 a week.

8. If a 3% tax on a car amounted to $53.25, what was the selling price of the car?

9. Mr. Johnson paid 3½% sales tax on his new station wagon. If the sales tax was $97.30, what was the cost of the station wagon?

10. A man paid $\frac{1}{20}$ of his income for state taxes and $\frac{1}{10}$ of his income for federal taxes. If his taxes amounted to $127.50, what was his income?

LEARNING ACTIVITY PACKAGE



SIGNED NUMBERS GO TO WORK

Ninety Six High School - Ninety Six, S.C.

General Math II

REVIEWED BY J. E. Byers

LAP NUMBER 20

WRITTEN BY J. E. Byers

RATIONALE

To enable us to subtract a larger number from a smaller number, a new set of numbers called negative numbers is needed. In this LAP the student will extend their understanding of the number system to include negative numbers and the operations on these numbers and they will also be introduced to mathematical graphs and their applications.

SECTION 1

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

1. Given a quantity, represent its opposite.
2. Given a list of positive or negative numbers, find their sum by using a number scale.
3. Given a list of positive or negative numbers or a combination of both, add them horizontally or vertically.
4. Given two numbers, positive or negative or a combination of both, find their difference by using a number scale and by setting them up horizontally or vertically.
5. Given two numbers, positive or negative or a combination of both, find their product.
6. Given two numbers, positive or negative or a combination of both, find their quotient.

RESOURCES

Reading and Problems

1. General Math II - #1, pp. 391-392, ex. 1-30 pp. 392 & 393: #2, pp. 393-397, ex. 1-47 pp. 397 & 398: #3, pp. 398-401, ex. 1-50 p. 402: #4, pp. 403-404, ex. 1-46 p. 405: #5, pp. 406-407, ex. 1-42 p. 408: #6, pp. 408-409, ex. 1-30 p. 409.
2. General Math I - #1, pp. 371-373, ex. 1-16 p. 373: #2, pp. 374-375, ex. 1-8 p. 376, pp. 377-378, ex. 1-18 p. 379, pp. 380-382, ex. 1-40 pp. 382 & 383: #3, ___: #4, pp. 383-385, ex. 1-30 p. 385, pp. 385-387, ex. 1-30 p. 388: #5, pp. 388-391, ex. 1-32 p. 391: #6, pp. 392-383, ex. 1-24 pp. 393 & 394:
3. Junior High School Mathematics 8 - #1 - #6, ___.

SELF-EVALUATION 1

WRITE THE OPPOSITE OF THE FOLLOWING:

1. +10

2. -200

3. -70

4. +3

FIND THE SUM OF THE FOLLOWING USING THE NUMBER SCALE.

5) +3, +5, +1

6) -4, 0, -3

7) -1, -6, -3

ADD THE FOLLOWING:

8) $\begin{array}{r} +3 \\ +2 \\ \hline \end{array}$

9) $\begin{array}{r} -3 \\ -8 \\ \hline \end{array}$

10) $\begin{array}{r} +2 \\ +6 \\ \hline \end{array}$

11) $\begin{array}{r} -3 \\ -2 \\ \hline \end{array}$

MULTIPLY THE FOLLOWING:

12) $\begin{array}{r} +3 \\ +7 \\ \hline \end{array}$

13) $\begin{array}{r} -6 \\ -4 \\ \hline \end{array}$

DIVIDE THE FOLLOWING:

14) +12 ÷ +6

15) -42 ÷ -7

SECTION 2

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

7. Given a list of numbers, positive or negative or a combination of both, combine them.

8. Given an equation with like terms, combine them and then solve the equation.

9. Given an expression or equation containing parentheses, simplify or solve whichever the case may be.

10. Given an equation with the unknown appearing in one or both members, solve the equation.

11. Given a verbal problem, set it up algebraically and solve it.

12. Given a formula and a graph of the formula determine the value of one variable when the other one is given.

13. Given a table of values, graph them and vice-versa.

14. Given a graph with a table of values plotted on it, write the ordered pairs and vice-versa.

15. Given a linear equation, make a table of values and then plot three of the points on a graph and draw a straight line through these points.

RESOURCES

Reading and Problems.

1. General Mathematics II - #7 & #8, pp. 409-410, ex. 1-24 p. 411: #9, pp. 411-414, ex. 1-28 p. 414: #10 & #11, pp. 415-417, ex. 1-18 pp. 417 & 418: #12 & #13, pp. 418-422, ex. 1-28 pp. 422-424: #14, pp. 424-426, ex. 1-16 pp. 427 & 428: #15, pp. 429-431, ex. 1-15 p. 432.

2. General Mathematics I - #7, ___: #8, pp. 342-345, ex. 1-42 p. 345: #9, pp. 302-304, ex. 4,5,8,9,10,11,12,15,20,21,22,25, & 26: #10, ___: #11, pp. 346-348, ex. 1-16 pp. 348 & 349: #12,#13, &#14, pp. 396-399, ex. 1-16 pp. 399 & 400: #15, ___:

3. Junior High School Mathematics 8 - #7 - #14, ___: #15, pp. 334-335, ex. 1-3 p. 335.

SELF-EVALUATION 2

COMBINE THE FOLLOWING AND SOLVE WHEN POSSIBLE.

1) $(+6x) + (-2x)$

2) $(-3N) + (-N)$

3) $3N - N = 14$

4) $8x - x = 56$

SIMPLIFY THE FOLLOWING AND SOLVE WHEN POSSIBLE.

5) $3(-3x)$

6) $-2(3x)$

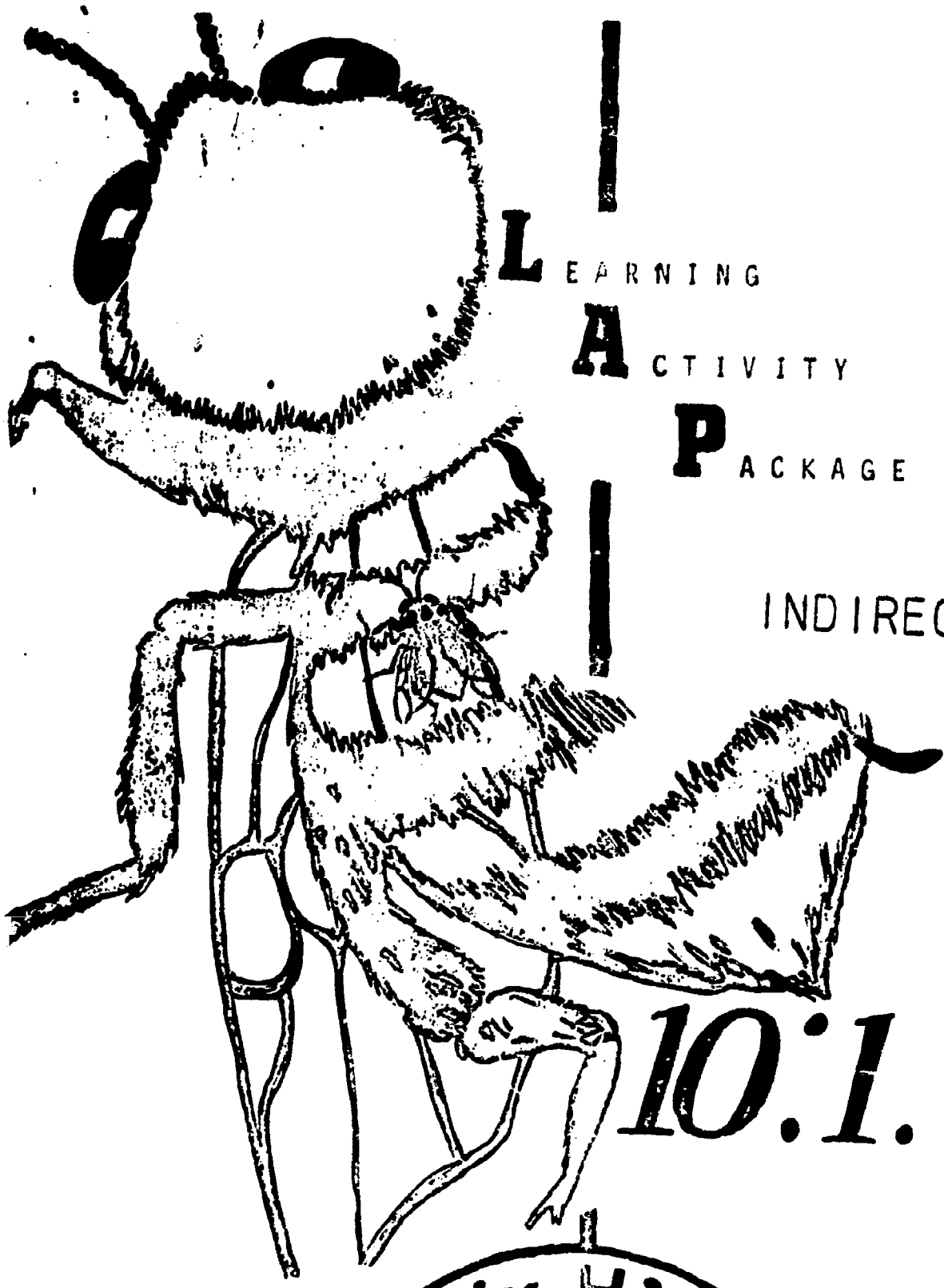
7) $5(x - 4) = 15$

8) $4(2N - 3) = 28$

9. If three times a number is added to 4, the result is -5. Find the number.

10. Draw a graph and plot the following values.

x	0	1	2	3	4	-4	-3	-2	-1
y	-1	-2	-3	-4	4	3	2	1	0



LAP

LEARNING ACTIVITY PACKAGE

INDIRECT MEASUREMENT

10.1.

Ninety Six High School - Ninety Six, S.C.

General Math II

REVIEWED BY

LAP NUMBER 21

WRITTEN BY J. E. Byers

RATIONALE

Many measurements can be found more readily by measuring indirectly than by measuring directly. Some measurements, such as the distance to the sun or the moon, can be found only indirectly. In this LAP you shall learn what is meant by indirect measurement and study several ways of measuring indirectly. You will also learn the meaning of a square root and how to compute it.

SECTION 1

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

1. Given a specific problem, solve it indirectly by using the correct formula.
2. Given a right triangle, name the legs and the hypotenuse and measure the acute angles with a protractor.
3. Given a right triangle with one side unknown, find its length by using the Pythagorean theorem.
4. Given a number, find its square root by using a table of squares.
5. Given a number, find its square root by computation.
6. Given a number, find its square root by using a table of square roots.

RESOURCES

Reading and Problems

1. General Math II - #1, pp. 439-440, ex. 1-10 p. 441: #2, pp. 443-444, ex. 1-10 pp. 445 & 446: #3, pp. 447-449, ex. 1-11 pp. 450 & 451: #4, pp. 453-455, ex. 1-18 p. 455: #5, pp. 456-458, ex. 1-15 p. 458: #6, pp. 459-463, ex. 1-25 pp. 463 & 464.

2. General Math I - #1, pp. 352-355, ex. 5-16 pp. 355 & 356: #2, ___: #3, pp. 356-358, ex. 1-10 pp. 358 & 359: #4 & #5, ___: #6, pp. 359-363, ex. 1-32 p. 364.

3. Junior High School Mathematics 8 - #1, ___: #2 & #3, p. 237, ex. 1 & 2, p. 238, ex. 1-3: #4 - #6, ___.

SELF-EVALUATION 1

1. If a boy saw a flash of lightning 3 seconds before he heard the thunder, how far away was the lightning?

2. The hypotenuse of a right triangle is 15" and one leg is 9". Find the length of the other leg.

3. One leg of a right traingle is 3' and the other leg is 4'. Find the length of the hypotenuse.

USE THE DIVISION METHOD TO FIND THE SQUARE ROOT OF:

4. 88

5. 189

SECTION 2

At the completion of your prescribed course of study, you will be able to:

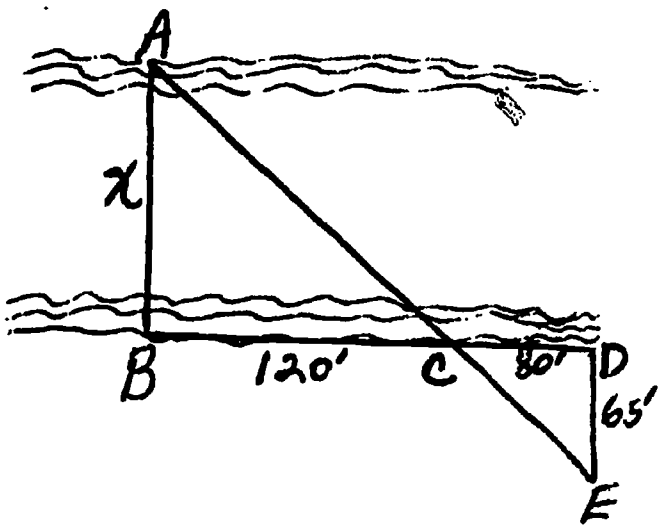
7. Given a diagram, find the length, width, etc. by using a scale drawing.
8. Given a specific problem, select a suitable scale and solve it by constructing a vector.
9. Giving a specific diagram, find the distance or height by using a scale drawing.
10. Given a pair of triangles, determine whether or not they are congruent.
11. Given a pair of triangles, determine whether or not they are similar.

RESOURCES

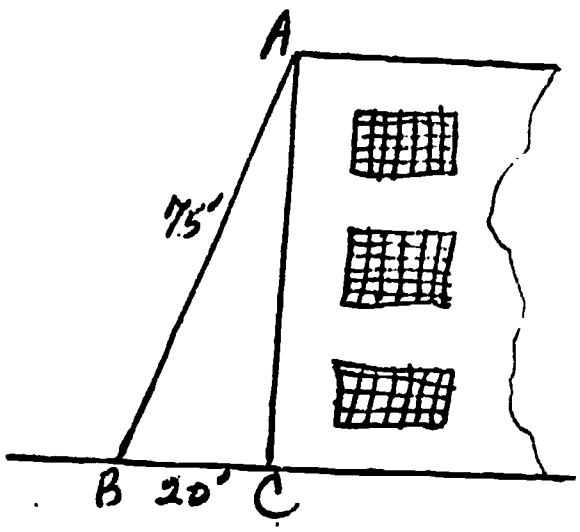
Reading and Problems.

1. General Math II - #7, pp. 466-470, ex. 1-10 pp. 470-472: #8, pp. 475-477, ex. 1-15 pp. 477 & 478: #9, pp. 479-481, ex. 1-10 pp. 481-482: #10 & #11, pp. 483-485, ex. 1-18 pp. 485-486.
2. General Math I - #7 - #10, ___: #11, pp. 352-355, ex. 1-4 pp. 355-356.
3. Junior High School Mathematics 8 - #7 - #10, ___: #11, pp. 230-231, ex. 1-3 p. 231.

1. Use the scale drawing ½" = 20' to find the distance AB.

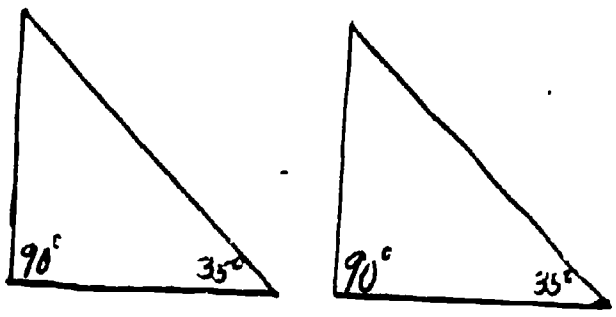


2. Find the height a 75' ladder will reach on a building if placed 20' from its base.



Determine whether or not the following pairs of triangles are similar or congruent.

3.



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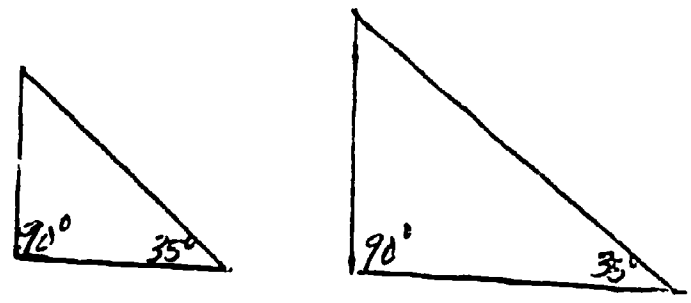
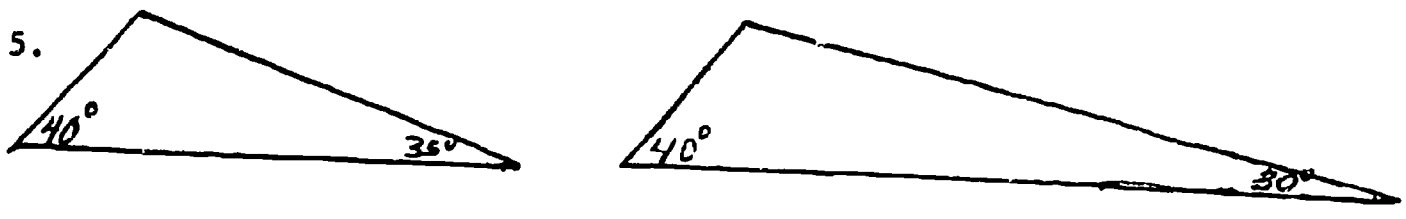
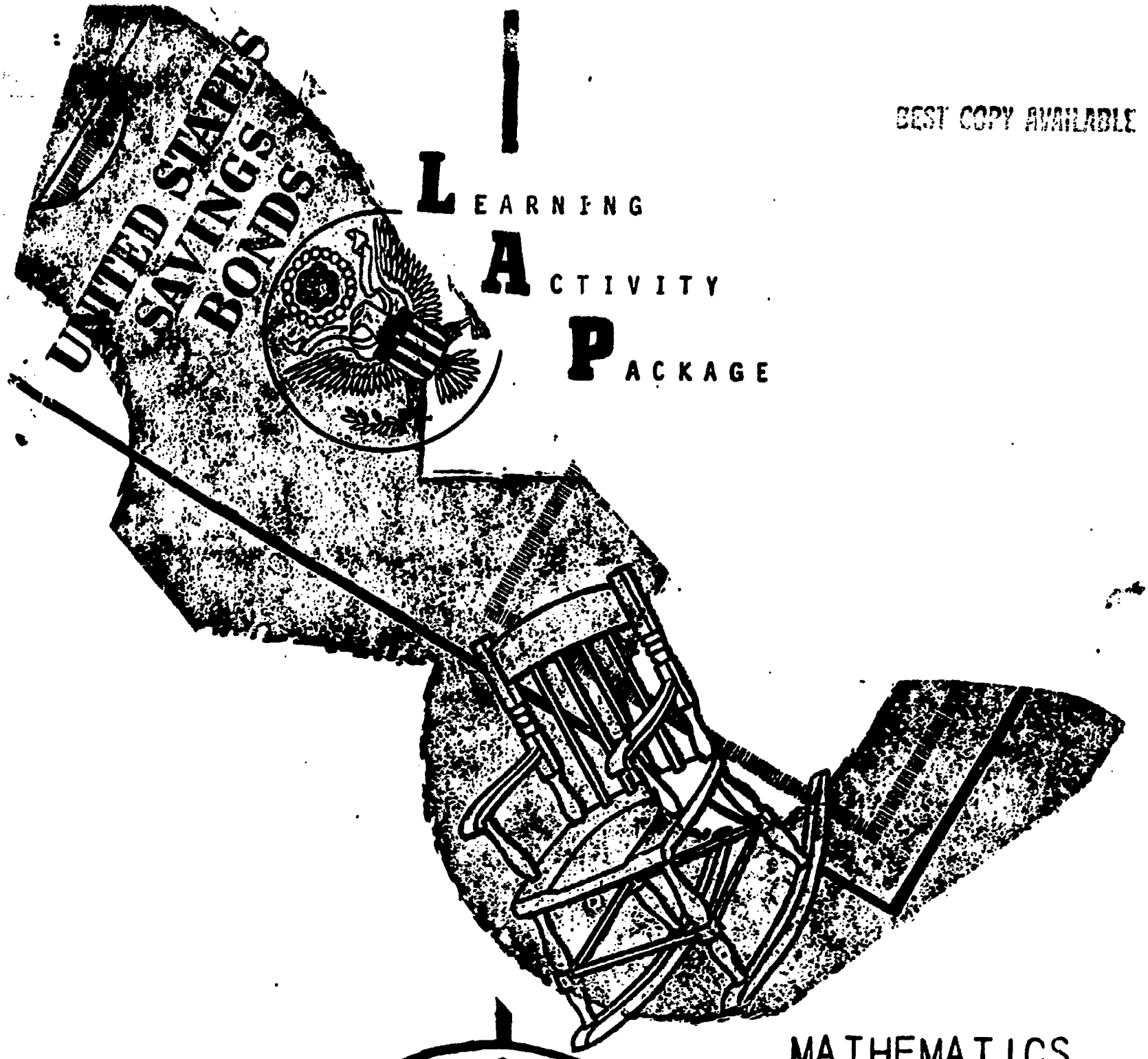


5.



LEARNING ACTIVITY PACKAGE



Ninety Six High School
Ninety Six, S.C.

MATHEMATICS AND SECURITY

General Math II

REVIEWED BY J. S. Ritchie

LAP NUMBER 22

WRITTEN BY J. E. Byers

RATIONALE

The objectives are to help the students become familiar with the purpose of insurance, social security, savings, stocks, bonds, and income tax and to provide additional practice in the fundamental operations.

SECTION 1

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

1. Given the value of textbooks lost by each section of a senior class, determine the largest value of lost textbooks for one class section.

2. Given a mortality table, determine how many will die within a given length of time.

3. Given any common fraction, transform it to a decimal.

4. Given a mortality table, determine how many persons of a given age will still be alive any given number of years later.

5. Given a premium table, determine the annual premium for a given term policy taken out at a given age.

6. Given a thirty-payment Life table, determine the loan or cash value of a policy at the end of a given number of years.

7. Given a table that shows the per cent of the income to be deducted from the salary for social security, determine the social security tax by a worker on a given weeks wage.

8. Given the computed per cent that you take of a person's average monthly earning, compute the social security benefit payment that they would receive from a given monthly wage.

RESOURCES

READINGS AND PROBLEMS

1. General Math II - #1, pp. 493-495, ex. 1-20 pp. 495 & 496: #2, pp. 496-499, ex. 1-8 p. 499: #3, pp. 499-502, ex. 1-20 p. 502: #4, pp. 503-505, ex. 1-20 pp. 505 & 506: #5, pp. 506-510, ex. 13-23 pp. 510 & 511: #6, pp. 512-513, ex. 1-18 pp. 513 & 514: #7, pp. 514-515, ex. 23-34 p. 516: #8, pp. 516-519, ex. 7-20 p. 519.

2. General Math I - #1 - #4, ___: #5, pp. 492-494, ex. 1 & 2 p. 495: #6, ___: #7, pp. 418-420, ex. 1-10 p. 420: #8, ___.

3. Junior High School Mathematics 8 - #1 & #2, ___: #3, pp. 320-321, ex. 1-4 p. 321: #4 - #8, ___.

SELF-EVALUATION 1

A class committee examined the lost-book records in the office. They reported their findings in the form of the following table:

VALUE OF TEXTBOOKS LOST BY SENIORS					
	1960	1959	1958	1957	1956
Section 8-1	$ 8.50	$ 6.40	$ 7.90	$20.80	$ 3.40
Section 8-2	12.30	8.30	11.40	7.40	9.80
Section 8-3	17.00	4.20	6.20	6.70	12.90

1. What was the largest value of lost textbooks for one class section?

2. Of the 971,397 persons of age 18 years, how many will die within one year? (Use the mortality table to answer this question, p. 498)

3. If three white marbles and two black marbles are placed in a bag, what is the probability that a marble, drawn at random, will be white?

4. Find the annual premium for a $2,000 ten-year term insurance taken out at age 23. (Tables on pages 508-510)

5. What is the cash surrender value or loan value of $2,000 thirty-year payment life insurance policy at the end of 30 years? (table on p. 512)

6. Find the social security tax paid in 1959 by a worker on a wage of $80 a week. (table on p. 515)

7. A worker, age 65, has earned an average of $300 a month since 1950. Find his monthly retirement benefit.

SECTION 2

Behavioral Objectives

At the completion of your prescribed course of study, you will be able to:

9. Given the formula for computing interest, find the simple interest on a specific amount of money at any given rate and time.

10. Given the formula for computing interest, find the compounded interest on a specific amount of money at any given rate and time.

11. Given a compounded interest table, determine what a specific amount of money at any given rate and time will amount to compounded annually or semi-annually.

12. Given the formula for computing the yield, determine the yield from a share of stock sold at a given amount and a given dividend.

13. Given a table of commission rates, determine the cost of and the commission on a given number of stock shares and the amount each share cost.

14. Given a table for the market prices of bonds, determine the price a bond of specific amount and a specific market value.

15. Given a federal income tax table and any other necessary information, determine the amount of refund, balance due, or the income tax itself of a specific taxable income.

RESOURCES

READINGS AND PROBLEMS

1. General Math II - #9, pp. 521-523, ex. 1,3,5,7,9,11,13,15,17,19,21, 23,25,27, & 29 p. 523: #10, pp. 523-526, ex. 1-20 pp. 526 & 527, pp. 527-528, ex. 1-10 pp. 528 & 529: #11, pp. 529-532, ex. 3-16 p. 533: #12, pp. 534-537, ex. 9-18 p. 537: #13, pp. 537-540, ex. 1-10 p. 540: #14, pp. 542-544, ex. 1-12 & 21-26 pp. 544 545: #15, pp. 546-551, ex. 1-22 p. 552.

2. General Math I - #9 & #10, pp. 476-479, ex. 1-5, p. 479: #11, pp. 481-485, ex. 1-5 p. 485: #12, #13, & #14, pp. 486-489, ex. 1-5 p. 490, ex. 13-17 p. 491: #15, pp. 422-425, ex. 1-5 p. 425, ex. 11-14, p. 426, pp. 427-429, ex. 1-12 p. 429.

3. Junior High School Mathematics 8 - #9 - #15, ____.

SELF-EVALUATION 2

1. Find the interest on $400 at 4% for one year.

2. How much will $600 amount to in two years if the interest rate is 4% compounded annually?

3. Use the formula $A = P(1 + r)^n$ to find the amount of $400 in three years at 5% compounded annually.

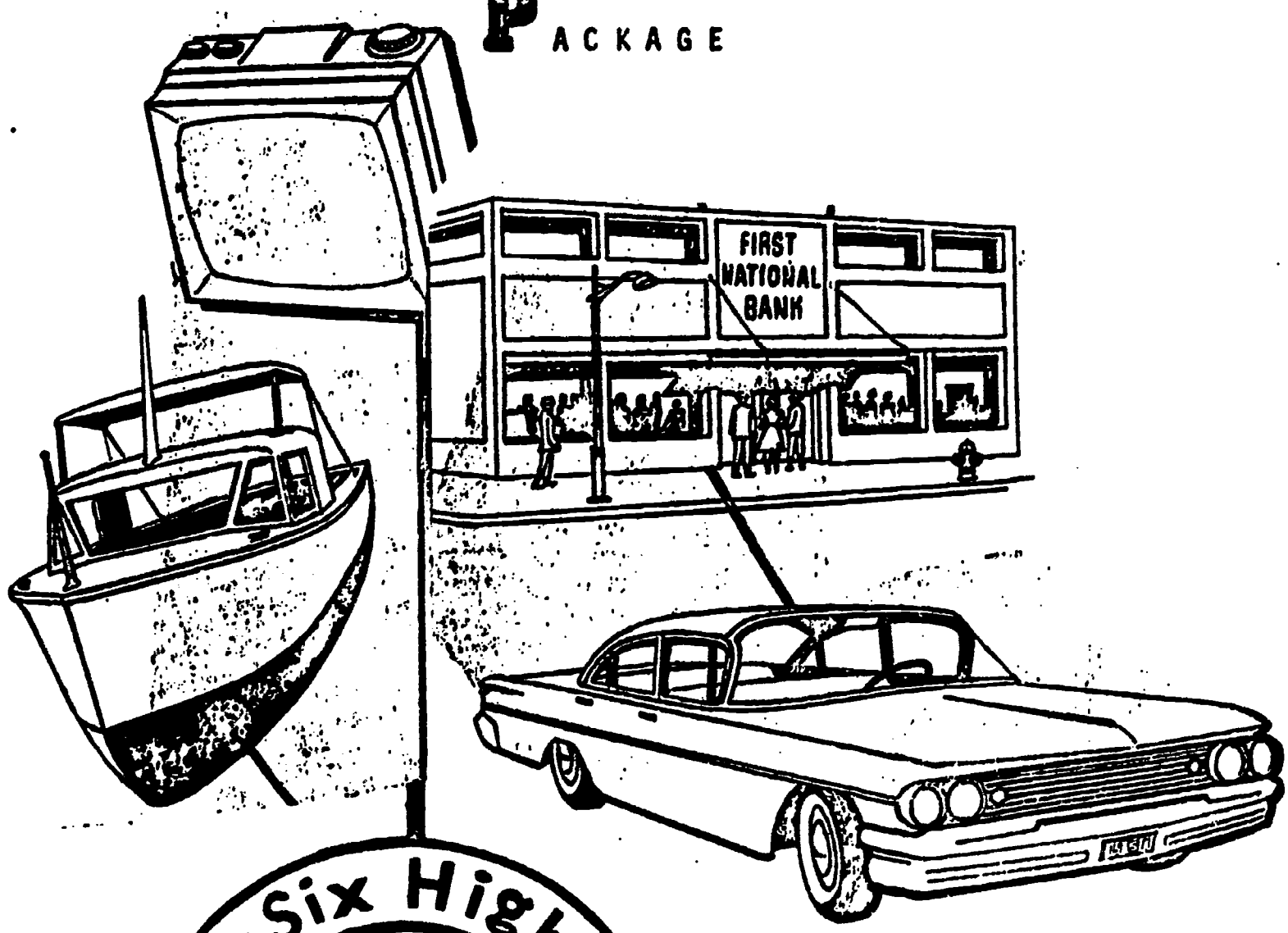
4. If General Motors sold at $42.63 a share and paid a twelve-month dividend of $2.00, find the yeild to the nearest per cent. (Hint: $i = \frac{D}{p}$)

5. Use the commission rates on page 539 to find the commission and cost of 100 shares at $10.00 a share.

6. A man had $243 withheld from his wages during the year. If his income tax is $217, what is the amount of the refund he will receive.

LEARNING ACTIVITY PACKAGE

MATHEMATICS FOR THE CONSUMER



Ninety Six High School
Ninety Six, S.C.

GENERAL MATH II

REVIEWED BY J. L. Hutchins

LAP NUMBER 23

WRITTEN BY J. E. Byers

RATIONALE

How much money does a high school student need each week? The answers may vary in different classes because of different needs. Some of these are food, clothing, entertainment, school supplies, personal needs, savings, etc. The objectives are to make the students aware of the need for mathematics in our everyday life pertaining to budgeting, determining discounts, and finding interest rates in installment buying. The opportunity to construct these different things will be given and will prove invaluable throughout their lives.

Section I

BEHAVIORAL OBJECTIVES

At the completion of your prescribed course of study, you will be able to:

1. Given a suggested budget for a typical high school student, determine what per cent was spent on each item in the budget.
2. Given a blank check and a check stub with the necessary information included, determine the following: (a) What is the number of the check? (b) Who will have to endorse the check? (c) What is the face of the check?
3. Given the list price of an item and the per cent off the regular price, determine the discount and sale price of that particular item.
4. Given the cash price of a particular item and also given the down payment, monthly payment, and the number of months you will have to pay buying on time, determine the carrying charge.
5. Given an anoumt of money borrowed, the rate of interest, and the time (in years) to pay it back, determine the interest that you would have to pay.

RESOURCES - Section I

Reading and Problems

I. General Math II - #1, pp. 559-561, ex. 17-28 pp. 561 and 562; #2, pp. 563-567, ex. 5-14 pp. 567-569; #3, pp. 569-571, ex. 11-30 pp. 571 and 572, pp. 572-573, ex. 1-20 pp. 573 and 574, pp. 575-576, ex. 1-20 p. 577; #4, pp. 577-578, ex. 1-26 pp. 578 and 579; #5, pp. 579-581, ex. 1-20 p. 582.

II. General Math I - #1, pp. 439-442, ex. 1-16 p. 442; #2, pp. 446-449, ex. 1-14 pp. 449-451, pp. 451-453, ex. 1-8 pp. 454 and 455; #3, pp. 461-463, ex. 1-24 pp. 463 and 464; #4 and #5, pp. 464-467, ex. 1-24 pp. 467 and 468, pp. 468-471, ex. 1-16 p. 472.

III. Junior High School Mathematics 8 - #1-#5, ____.

Self Evaluation - Section I

Suggested Budget for a Typical High School Student.

Weekly Earnings or Allowance - $10.00

	Food	Personal Needs	Clothing	Entertainment	School Supplies	Gifts & Savings
Amount	$2.20	$1.60	$1.20	$3.00	$ .80	$1.00
% of Total	22%	16%	12%	30%	8%	10%

1. What per cent was spent on each item?

Write each of the following in two ways it would appear on the face of a check.

2. $84.10

3. $123.00

4. During a sale, cameras were advertised at 20% off the regular price. What is the sales price of a camera which lists for $50?

5. A sofa has a list price of $180. Find the net price if the retailer receives a discount of 20%.

Section II

BEHAVIORAL OBJECTIVES

At the completion of your prescribed course of study, you will be able to:

6. Given an item marked at a particular amount, the amount you will have to pay down, and the amount you will pay each month for a given number of months, determine the rate of interest charged under the installment plan.

7. Given a set of numbers, determine the average (mean) of them.

8. Given a cash price, down payment, monthly payments, and the number of months to pay, construct a table of payments.

9. Given the average principal formula for finding the rate of interest in installment buying, find the rate of interest charged on the installment plan for any item with the list price, down payment, monthly payments, and the number of months to pay given.

RESOURCES - Section II

I. General Math II - pp. 583-585, ex. 13-30 pp. 585 and 586: #7, pp. 586-588, ex. 1-22 pp. 588 and 589, pp. 589-592, ex. 1-14 p. 592, #8, pp. 593-596, ex. 1-16 pp. 596 and 597: #9, pp. 597-598, ex. 1-18 p. 599.

II. General Math I - #6, pp. 473-475, ex. 1-14 p. 475: #7, ____: #8 and #9, pp. 481-485, ex. 1-14 p. 485.

III. Junior High School Mathematics 8 - #6-#9, ____.

Self Evaluation - Section II

1. Henry can buy ice skates for $14.00 cash or $3 down and $3 a month for 4 months. What is the carrying charge for buying on time?

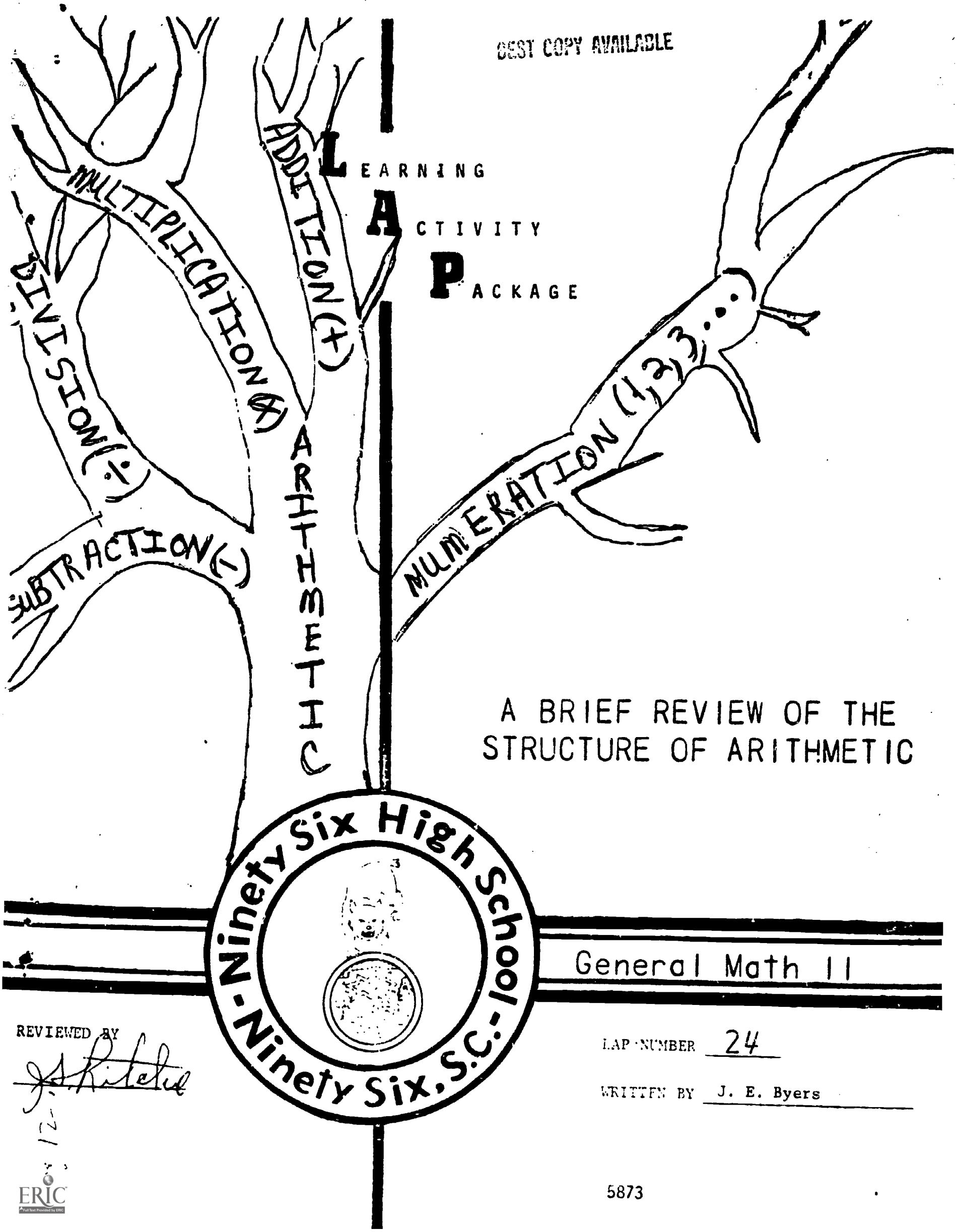
Find the mean of each of the following sets of numbers.

2. $200, $185, $150, $155, $140, $130

3. $10, $12, $16, $14, $18, $62

Use the average principal formula $\frac{24I}{(f+1)N} = r$ to find the rate of interest of the following.

	Cash Price	Down Payment	Monthly Payments	Number of Months
4.	$250	$60	$36	6
5.	$50	$10	$9	6



LEARNING ACTIVITY PACKAGE

A BRIEF REVIEW OF THE STRUCTURE OF ARITHMETIC

Ninety Six High School · Ninety Six, S.C.

General Math II

REVIEWED BY J. S. Ritchie 12-

LAP NUMBER 24

WRITTEN BY J. E. Byers

5873

RATIONALE

The objectives of this LAP are to extend the student's understanding of the decimal system by introducing various ways of expressing numbers and to develop an appreciation for the arithmetic system by showing how the system can be developed deductively.

BEHAVIORAL OBJECTIVES

At the completion of your prescribed course of study, you will be able to:

1. Given a specific numeral, show the meaning of it by the use of a place value chart. Also analyze the numeral.
2. Given a base 10 numeral, express it in base 2, base 5, or base 6 and vice versa.
3. Given two numerals expressed in base 2 numerations, add or multiply them and then check your answers.
4. Given a statement in mathematical language, prove it by using assumptions that you will have previously studied.

RESOURCES

Reading and Problems

1. General Mathematics II - #1, pp. 605-608, ex. 1-32 pp. 608 & 609: #2, pp. 510-612, ex. 1-28 p. 612: #3, pp. 612-616, ex. 1-18 p. 617: #4, pp. 617-619, ex. 1-40 p. 620; pp. 620-624, ex. 1-20 p. 624; pp. 625-627, ex. 1-10 p. 628.

2. General Mathematics I - #1, pp. 171-175, ex. 1-16 p. 175: #2, pp. 89-92, ex. 1-16 pp. 92 & 93; pp. 93-95, ex. 1-36 pp. 95 & 96: #3 & #4, ____.

SELF-EVALUATION

Analyze the numerals (base 10).

1. 132

2. 2047

Express in base ten notations.

3. 21_5

4. 34_6

5. 101_3

6. 101_2

Add and Check.

7. 101_2
   110_2

Find the product and check.

8. 100_2
   $\times 111_2$

State the assumptions which apply to the following:

9. $7 + 6 = 6 + 7$

10. $(2 + 3) + 4 = 2 + (3 + 4)$